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Twenty-First Anniversary

Volume 22 OCTOBER 1953 Number 10

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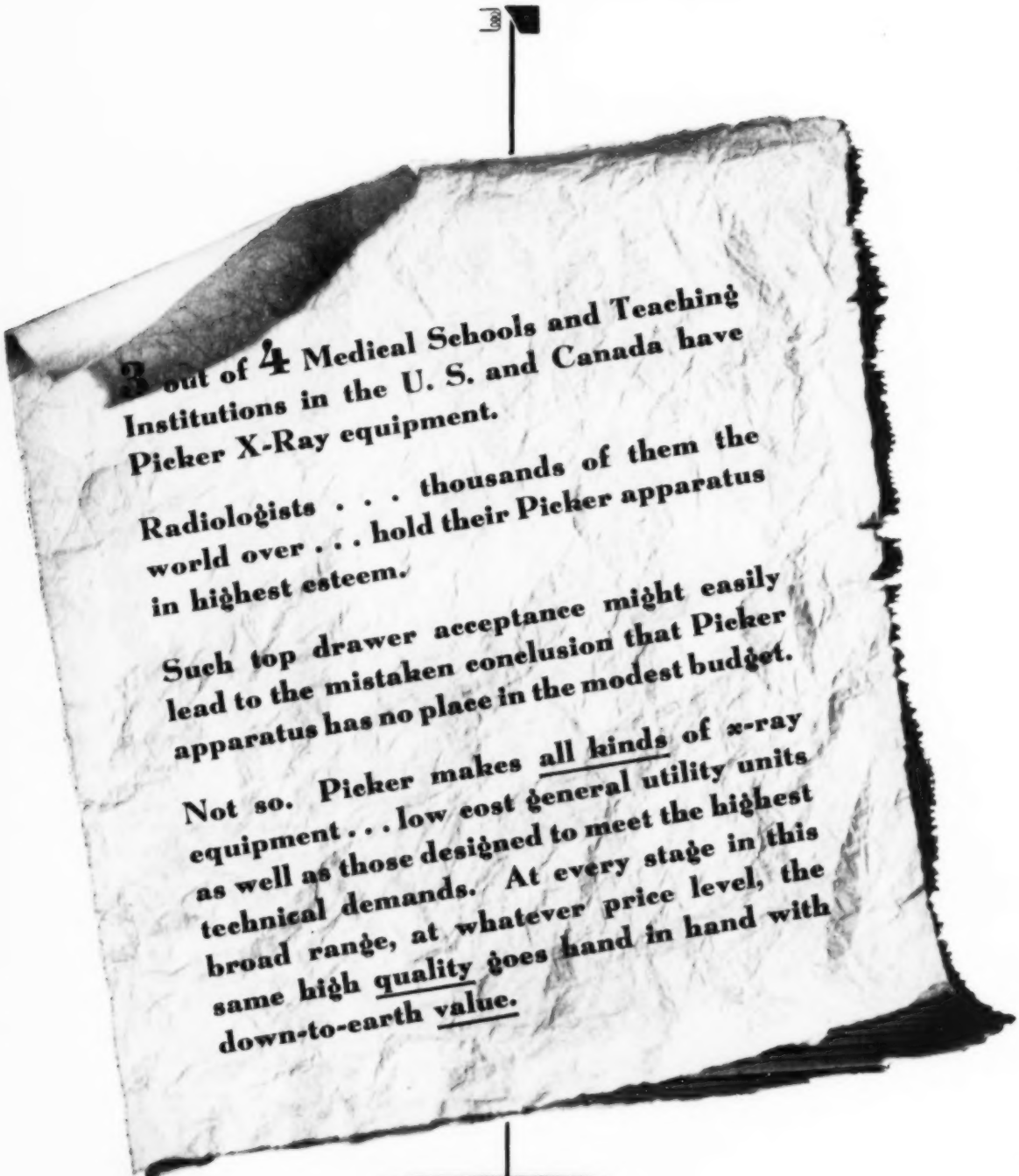
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This Issue

BIRTHDAY anniversaries are said to be occasions when the young look forward and the old look back. Young—just 21—this Journal looks forward. It has much to look forward to. America finds itself in the midst of an industrial culture. Every human being throughout the land is touched by industry. Increasingly Industrial Medicine, and its Journal, will be part of that culture. Likewise, this Journal has much to look forward from—the rich past merged into the mature present. Its lookout point is the vivid, living *now*. From that lookout point, with a freer format and a suspension of the usual, there is presented this month a panorama — factual, graphic, possibly a little dramatic, but a true picture of the industrial physician and the field of his work. A true picture, but an incomplete one, for it is as impossible to compress Technology's Physician into book and page as it would be to epitomize technology itself. Close to the growth of industrial medicine through many years, this Journal has watched its fluidity of function spread into new environments and unexplored areas of old ones, but not until the Editors undertook the circumscription of its reach did they fully appreciate the extent of its spread and the accelerating tempo of its development. The most they can do is to seize it at an instant of its movement, and hope the high points the camera catches may cut the profile of a tribute to its progress, and fix a reference point for the years to come when they examine the book of the past. The picture, therefore, as to both the industrial physician and his field, is a cross-section of the immediate—with here and there a hint of history, or a small reminder of the self-made pioneers who long ago laid down the fine foundations of the now. The fact that today's portrayal will be out-dated tomorrow is evident from the up-swing of the charted curves. Even as this is written, the IMA membership has increased by near a hun-

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dred since the chart on page 433 was prepared. . . .

Throughout these pages the terms, "industrial health," "occupational health," "occupational medicine," etc., are used as synonymous with "industrial medicine." All of them connote the physician-directed movement toward the same objective—the conservation of the worker. And all embrace the physician's professional associates—the industrial hygienists, the industrial nurses, and the industrial dentists.

Much that might have enhanced the fullness of this picture's detail had to be omitted, such, for example, as an account of the substantial literature of the last two decades. But there will be other issues; this one is not a valedictory. On the contrary, it is a salute—to management, to medicine, and to the opportunities of another 21 years of association with both. . . .

THERE are certain highlights in this picture, which need no pointing out. One of them, however, may be mentioned with the thought of adding to it here. It is the "Contrasts," on page 433. The added contrast—this one all modern—evolves in dollars and cents. Fringe benefits, holidays, vacation payments, bonuses, special awards, profit-sharing plans, pensions, premiums, etc., now so popular, amount, in the United States, to 25 *billion* dollars annually. This is 18.5% of payroll. In dollars per employee per year, it is $644. The contrast is between that amount and the approximate $15-$19 per employee per year which good medical service costs. Considering the foregoing, deliberately we have not said much about costs in these pages. It is time now to begin evaluating the intangibles of good medical service in terms that will make the bookkeeping entries a mere formality. Good medical service is worth so much more than can be measured with a financial yardstick as to make the dollars-and-cents almost trivial.

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dustrial hygiene staffs or the only ones directing their activities to more than matters of environment. Lumbermens, Zurich, Travelers, Aetna, and several others, while interested chiefly in the environment, are deeply conscious of the medical needs and are working toward their proper handling. Notable in this respect is Employers Mutuals of Wausau, Wisconsin, which provides a field nursing service for policyholders. This company was the first to introduce such a service; it was begun in 1928, and it has continued without interruption, year by year becoming more important as a factor in the increasing spread of industrial medicine throughout the United States.

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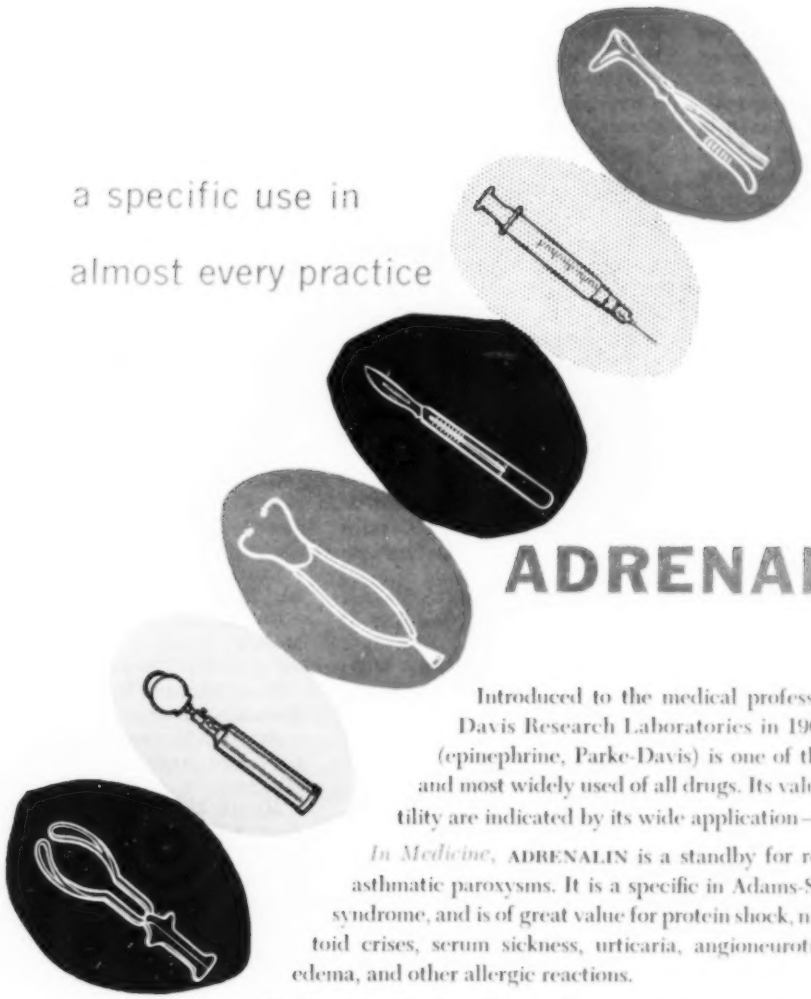

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IN LARGE ways and small, this presentation owes much to the cooperation and aid of many. Among them, the following "better wisdoms which have freely gone with this affair along. For all, our thanks":

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AND last in mention, but paramount in importance, the loyal advertisers, whose long-time support of the field of Industrial Medicine and its Journal has been of inestimable value to both. Again: "For all, our thanks!" We are grateful.

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The many changes that have taken place in industry over the past two decades have created an increasing need for well-planned and effective Industrial Medical programs. As the mechanical causes of accidents have yielded to control, the human causes have become more prominent. At the same time, the need for greater emphasis on the individuals who collectively constitute the back-bone of American industry has been intensified by the greater stresses and strains imposed by the change to an "adaptive" economy. To meet this need within the industrial framework, Liberty Mutual began, ten years ago, to explore the promise held forth by the science of Industrial Medicine and Nursing.

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"The Arches of the Years"

1900—Automobile traffic fatalities began (first one in 1899). United States Government began officially to compile mortality statistics.

1901—George De Schweinitz, of Philadelphia, wrote on blindness due to wood alcohol. George M. Price, of New York, published a handbook on sanitation.

1902—First official industrial hygiene survey in the United States. Meads and Gies reported on "The Physiological and Toxicological Effects of Tellurium Compounds." Harrington's "Practical Hygiene" published.

1903—First airplane flight (Wright Brothers at Kitty Hawk). Ford Motor Company founded. United States Department of Labor and Commerce established.

1904—Panama Canal begun. New York subway opened. Moire, at Hudson River Tunnel, first used the medical air lock in caisson disease.

1905—Winslow, at Massachusetts Institute of Technology, inaugurated the first course in industrial hygiene. Lee, of New York, investigated industrial fatigue. Thomas R. Crowder, of Chicago, appointed Medical Director, Pullman Company.

1906—First recorded example of group physical examinations. Pure Foods and Drugs Act passed. First Federal law for compensation of injuries in interstate commerce.

1907—Hanson, of Massachusetts Board of Health, published "The Effect of Industry on Health." The first industrial hygiene exhibit in the country was held at Boston. Modern plastic era began, with the discovery of Bakelite.

1908—The first commission on occupational diseases established, in Illinois. Federal Bureau of Investigation created. George M. Kober published "Industrial and Personal Hygiene."

1909—Admiral Peary discovered the North Pole. Rockefeller gave a million dollars to fight hookworm. Metropolitan Life Insurance Company organized industrial nursing as a part of its welfare division. Harry Moek, at Sears Roebuck, made the first pre-employment medical examinations.

1910—The first occupational disease clinic held at Cornell Medical School, out-patient department. United States Bureau of Mines created in the Department of the Interior.

1911—Alice Hamilton reported on the lead industry. Amundsen discovered the South Pole. A law requiring monthly examinations for workers in certain hazardous industries passed in Illinois.

1912—White phosphorus in matches abolished by prohibitive Federal taxation. Munsterberg, of Harvard, began the application of psychology in industry; first use was to test and select motormen on the Elevated in Boston.

1913—The First State Industrial Hygiene Bureaus were established, in New York and Ohio. First registry for industrial nurses opened in Boston. Emery R. Hayhurst, of Columbus, made the first state-wide survey in industrial hygiene for the Ohio Board of Health. George M. Price inaugurated the first union medical care plan (HLGWU), now the Union Health Center.

1914—Ebright, of San Francisco, reported on the effects of nitroglycerine on those engaged in its manufacture. Bureau of Mines began using canaries and mice for detecting CO in mines. First modern American texts: "The Occupational Diseases," by Thompson; "The Modern Factory," by Price. Public Health Service inaugurated studies on industrial hygiene.

1915—American Association of Industrial Physicians and Surgeons (IMA) organized in Illinois. First scientific symposium on industrial medicine and hygiene sponsored by AMA. American Medical Association created a Section on Industrial Medicine. New York City Health Department established a clinic for occupational diseases.

1916—Congress enacted model Workmen's Compensation Law for civilian employees. Kober and Hanson published their classic, "Diseases of Occupational and Vocational Hygiene."

1917—United States entered First World War. Hawaii first U.S. jurisdiction to enact occupational disease compensation law. Alice Hamilton brought the growing menace of benzol poisoning in American industry to the attention of the medical profession.

1918—United States air mail service instituted. Harvard established a School of Industrial Hygiene, leading to a degree. Leroy Gardner, of Saranac, began extensive research on tuberculosis and pneumoconiosis. World War armistice, November 11.

1919—First professional periodical in the field of industrial health (*Journal of Industrial Hygiene*) established at Harvard; later became *Journal of Industrial Hygiene and Toxicology*; now *Archives of Industrial Hygiene and Occupational Medicine*, published by AMA. Clarence D. Selby, of Detroit, prepared a standardized periodical examination form adopted in 64 major plants; also made the first nation-wide survey of medical and surgical facilities in industrial establishments.

1920—First regular broadcast of radio programs (KDKA, Pittsburgh). First broadcast of weather and crop reports.

1921—Insulin discovered. Alice Hamilton described trinitrotoluene poisoning. Henderson and Haggard, of Yale, developed the H.H. Inhalator. Safety code for lighting factories, mills and work places issued by American Standards Association.

1922—The Danbury hatters' episode. Henry Field Smyth, University of Pennsylvania, reported on industrial anthrax, and carbon tetrachloride toxicity.

1923—R. R. Sayers and W. P. Yant developed a method to determine carbon monoxide in blood and air. Sayers reported on hydrogen sulphide. Teapot Dome scandal.

1924—First American to receive the degree Dr. P.H. in the field of industrial hygiene (C. O. Sappington, M.D., at Harvard). First death from radium dial disaster, in a watch dial factory. The basophilic aggregation test for lead intoxication discovered by Carey P. McCord, of Cincinnati.

1925—Alice Hamilton published her classic: "Industrial Poisons in the United States." The first successful autogiro flight.

1926—American College of Surgeons appointed a Committee on Industrial Medicine and Traumatic Surgery. First city survey of industrial hygiene problems made in Nashville, Tennessee.

1927—Lindbergh flew the Atlantic. "The Jazz Singer" was the first talkie. May R. Mayers, of New York, reported on the lead line, arteriosclerosis, and hypertension in 381 lead workers.

1928—Henry F. Smyth, Jr., University of Pennsylvania, conducted inhalation experiments with certain solvents.

1929—Little America established in Antarctic by Admiral Byrd. Woods showed by clinical and radiographical tests that asbestosis differs from silicosis. After a four-year study in mental health problems conducted by R. H. Macy & Company in New York, V. V. Anderson published "Psychiatry in Industry."

1930—Dublin and Vane, Bureau of Labor Statistics, published "Causes of Death by Occupation." May R. Mayers reported on "Carbon Monoxide Poisoning in Industry."

1931—Neoprene one of the first successful synthetic rubbers developed. Winslow and Greenburg reported on the dust hazard in sand blasting. Kehoe, and associates, of Cincinnati, reported on "Normal Absorption and Excretion of Lead."

1932—First issue of *Industrial Medicine* published, October 5. Work started on Gauley Bridge. Proden, of Harvard, reported on the toxicity of cadmium. Legge and Rosencrantz, University of California, reported that diatomaceous earth produced pneumoconiosis. McCord reported on the toxicity of trichlorethylene.

1933—Gardner and Cummings showed that the tissue reaction which quartz elicits in silicosis depends on particle size. Nationwide death records began. Prohibition amendment repealed.

1934—First Saranac Symposium held, Schofield, of Sacramento, reported on "Heat Prostration and Treatment" at Boulder Dam. Division of Labor Standards established.

1935—Belknap, of Milwaukee, reported on lead poisoning in the battery industry. Social Security Act passed. Commercial air service over the Pacific inaugurated.

1936—Industrial Hygiene Foundation organized. National Silicosis Conference held in Washington. USPHS reported on air pollution in industry. Hayhurst, of Columbus, reported on "Poisoning by Petroleum Distillates."

1937—Council on Industrial Health established by American Medical Association. Division of Industrial Hygiene established in Public Health Service. W. J. McConnell, of New York, reported on "Volatile Solvents." Loyal Shoudy and Anna Baetjer published their researches on "Heat and Muscular Work."

1938—Nylon developed. Television first put on the market. American Conference of Governmental Hygienists organized. M. N. Newquist reported on "Medical Services and Workmen's Compensation Laws."

1939—Harvey Bartle, of Philadelphia, reported on "Hygiene and Medical Care of Workers on American Railroads." Indiana State Health Department first to employ an industrial nursing consultant. American Industrial Hygiene Association organized.

1940—Ramazzini's "Diseases of Workers," translated by Wilmer Cave Wright. Electric shock therapy used in mental diseases. Electron microscope invented.

1941—Penicillin discovered. R. T. Johnstone, of Los Angeles, published his "Occupational Disease." Hedwig S. Kuhn, of Hammond, Indiana, reported on "Visual Defects in Industry, 16,332 Cases." V. G. Knudsen, of California, reported on "Noise in Warfare and Welfare." Pearl Harbor, December 7.

1942—American Association of Industrial Nurses organized. Ramazzini Society founded. United Nations established.

1943—American Association of Industrial Dentists organized. National Safety Council created its Industrial Nursing Section. Van Ordstrand and Hughes, of Cleveland, first Americans to describe beryllium poisoning.

1944—DDT discovered. Mathematical robot put into action. Underwater camera perfected. Jet propulsion developed for airplanes. Von Oettingen, of Washington, reported on the hazards of carbon monoxide.

1945—First atomic bomb dropped on Hiroshima. American Foundation of Occupational Health established. Bamberger, of Bethlehem, reported on "Aluminum Therapy in Silicosis." Lydia Giberson, of New York, wrote on "The Modern Concept of Psychiatry in Industrial Medicine." BAL developed and used. W. A. Cook published "Maximum Allowable Concentrations of Industrial Atmospheric Contaminants."

1946—*American Industrial Hygiene Association Quarterly* established. Harvey and Luongo published their report on "Physical Capacity for Work." United Nations formed WHO. American Academy of Occupational Medicine organized. Victor Heiser, of New York, wrote on "Practical Benefits of Industrial Health."

1947—First instrument-controlled pilotless plane across the Atlantic. Artificial rain making began. Sterner, of Rochester, reported on "Tracer Isotopes in Industrial Toxicology." Forbes, of Yale, reported on "Industrial Selenosis." Sander, of Milwaukee, wrote on "The Benign Pneumoconiosis Due to Metal Fumes and Dusts."

1948—Jet plane speed exceeded the speed of sound. The smog disaster at Donora, Pennsylvania. Aureomycin and Polymyxin discovered. The 200-inch telescope on Mt. Palomar completed.

1949—Hormones, Cortisone, and ACTH put on market. Dramamine for sea-sickness relief developed. R. T. Johnstone, of Los Angeles, wrote on "Occupational Medicine, Its Role in the Social World."

1950—Radiocarbon atomic calendar for dating archaeological objects came into use. Research began on the hydrogen bomb. Colored television authorized. L. E. Hamlin and H. J. Weber, of Chicago, wrote on "Siderosis, a Benign Pneumoconiosis Due to Inhalation of Iron Dust." Rusk, of New York, reported on "The Third Phase of Medicine, Rehabilitation."

1951—Discovery of anti-atomic radiation substances. Use of atomic bombs in artillery and guided missiles. Atomic Energy Commission announced the production of electric power from atomic energy.

1952—The hydrogen bomb. Polio protection—gamma globulin and two virus vaccines. Isoniazid in treatment of tuberculosis.

1953—Establishment in the Cabinet of Secretary of Health, Education and Welfare.

some cases need

MORE POWER

When injudicious food habits of long standing leave nutritional reserves dangerously low, intensive therapy is required for prompt replenishment of Vitamins and Minerals.

Viterra Therapeutic concentrates in one capsule sufficient amounts of Minerals and Trace Elements and the effective therapeutic potencies of essential Vitamins needed for rapid and complete correction of chronic deficiency states.

Whenever potent Vitamin-Mineral therapy is indicated, specify

Viterra Therapeutic

each capsule *contains*

VITAMIN A	25,000 U.S.P. Units	COPPER	1.0 mg.
VITAMIN D	1,000 U.S.P. Units	IODINE	0.15 mg.
VITAMIN B_{12}	5 mcg.	IRON	10.0 mg.
VITAMIN B_1	10 mg.	MAGNESIUM	6.0 mg.
VITAMIN B_2	5 mg.	MANGANESE	1.0 mg.
NIACINAMIDE	100 mg.	MOLYBDENUM	0.2 mg.
VITAMIN C	150 mg.	PHOSPHORUS	80.0 mg.
CALCIUM	103.0 mg.	POTASSIUM	5.0 mg.
COBALT	0.1 mg.	ZINC	1.2 mg.

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Health Through Cleanliness Since 1837

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germicide · fungicide · deodorizer

both cationic and nonionic detergency for better penetration and cleansing

action prolonged for hours

Many uses in ward and clinic: backrubs; skin prep; hydrotherapy; hand disinfection; thermometer, syringe, instrument disinfection; skin preparation for injections; diaper rinse to prevent rash.

Superior in safety, *Bactine* contains no phenol, mercury or iodine. It is stable, uniform and effective in high dilutions. Nurses and patients find it pleasant – gentle to skin, nonstaining and agreeably aromatic.

Bactine: **Available in 1-gallon, 1-pint and 6-ounce bottles from your regular supplier. Handy refillable spray type dispenser furnished with order at no extra charge.**

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therapy
is a key
to well-being
Specify

Pfizer ANDROGENS

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Pfizer PROGESTERONES

Pfizer COMBINATIONS

Pfizer SPECIALTY

SYNANDROTABS*	Methyl Testosterone, U.S.P., Tablets 10 mg. and 25 mg.
SYNANDRETS*	Testosterone, U.S.P., Transmucosal Tablets 10 mg. and 25 mg.
SYNANDROL*	Testosterone Propionate, U.S.P., in Sesame Oil 25 mg., 50 mg. and 100 mg. per cc.; in single-dose disposable STERAJECT® cartridges and in 10 cc. multiple-dose vials
SYNANDROL*-F	Testosterone, U.S.P. in Aqueous Suspension 25 mg., 50 mg. and 100 mg. per cc.; in 10 cc. multiple-dose vials
DIOGYNETS*	Estradiol, U.S.P., Transmucosal Tablets 0.125 mg., 0.25 mg. and 1.0 mg.
DIOGYN*-E	Ethinyl Estradiol Tablets 0.02 mg., 0.05 mg. and 0.5 mg.
DIOGYN*	Estradiol, U.S.P., in Aqueous Suspension 0.25 mg. and 1.0 mg. per cc.; in single-dose disposable STERAJECT cartridges and in 10 cc. multiple-dose vials
DIOGYN*-B	Estradiol Benzoate, U.S.P., in Sesame Oil 0.33 mg. and 1.0 mg. per cc.; in 10 cc. multiple-dose vials
ESTRONE	Estrone, U.S.P., in Aqueous Suspension 2 mg. and 5 mg. per cc.; in 10 cc. multiple-dose vials
SYNGESTROTABS*	Ethisterone, U.S.P., Tablets 10 mg., 25 mg. and 50 mg.
SYNGESTRETS*	Progesterone, U.S.P., Transmucosal Tablets 10 mg., 20 mg. and 50 mg.
SYNGESTERONE* IN SESAME OIL	Progesterone, U.S.P., in Sesame Oil 10 mg., 25 mg., 50 mg. and 100 mg. per cc.; in single-dose disposable STERAJECT cartridges and in 10 cc. multiple-dose vials
SYNGESTERONE* IN AQUEOUS SUSPENSION	Progesterone, U.S.P., in Aqueous Suspension 25 mg. and 50 mg. per cc.; in 10 cc. multiple-dose vials
COMBANDRIN*	Estradiol Benzoate, U.S.P., 1 mg. per cc. and Testosterone Propionate, U.S.P., 20 mg. per cc. in Sesame Oil. In single-dose disposable STERAJECT cartridges and in 10 cc. multiple-dose vials
COMBANDRETS*	Estradiol, U.S.P., 1 mg. and Testosterone, U.S.P., 10 mg. per Transmucosal Tablet
NEODROL*	Stanolone in Aqueous Suspension 50 mg. per cc.; in 10 cc. multiple-dose vials

*TRADEMARK

PFIZER LABORATORIES

Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N.Y.

Relief of "sore throat"

Slow-dissolving, candy-like troches providing

- wide antibacterial spectrum
- effective local anesthesia

SUL-PONDETS®

Each SUL-PONDET contains:

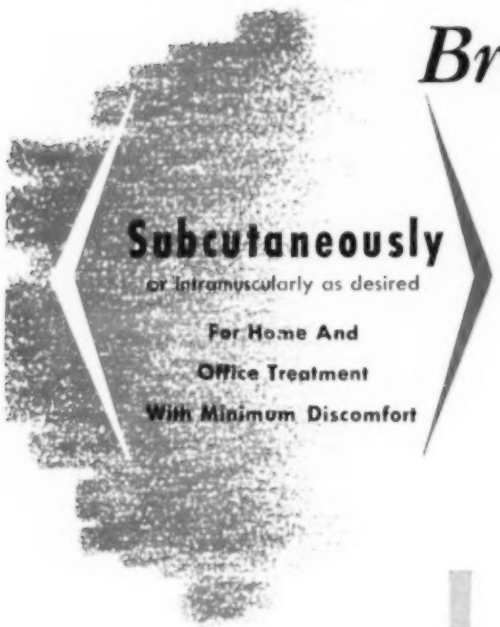
Penicillin	20,000 units
Bacitracin	50 units
Sulfadiazine	2 grains
Benzocaine	3 mg.

For cases in which you wish to prescribe penicillin and bacitracin only, the original and widely prescribed PONDETS are available.

Wyeth

Philadelphia 1, Pa.

Significant Simplification in the Routine Management of *Bronchial Asthma*



Self-administered As Easily As Insulin: A Patient Treated With HP*ACTHAR *Gel*

A woman 36 years of age had to be hospitalized five times in 18 months for severe status asthmaticus which usually developed after each respiratory infection.

The problem of recurrent attacks was effectively controlled when the patient was taught self-administration of HP*ACTHAR *Gel*. She has given herself five courses of HP*ACTHAR *Gel* during the past year. Each course took from 3 to 5 days, and the results were so satisfactory that *no hospitalization was required.*

(Levin, S. J.: Ann. Allergy 11: 157-169, 1953; Case 6)

Advantages of HP*ACTHAR *Gel*

Fewer Injections:

One or two doses per week in many instances.

Rapid Response, Prolonged Effect:

Combines the two-fold advantage of sustained action over prolonged periods of time with the quick response of lyophilized ACTHAR.

Much Lower Cost:

Recent significant reduction in price, and reduced frequency of injections, have advanced economy of ACTH treatment.

HP*ACTHAR *Gel*
(IN GELATIN)

*Highly Purified. ACTHAR® is The Armour Laboratories Brand of Adrenocorticotropic Hormone—ACTH (Corticotropin).

THE ARMOUR LABORATORIES
A DIVISION OF ARMOUR AND COMPANY · CHICAGO 11, ILLINOIS

world-wide dependability

PHYSIOLOGIC THERAPEUTICS THROUGH RESEARCH

In infectious and allergic rhinitis and sinusitis

Biomydrin "is effective as an antibiotic in clearing the nose of pathogenic organisms and purulent secretions. In many cases, sterile cultures were obtained after a brief period of treatment."

Antibiotics & Chemotherapy *3*:299 (March) 1953.

Improvement in 113 of 124 Patients*

Diagnosis	Number of patients	Improved
Chronic catarrhal rhinitis	11	11
Chronic allergic rhinitis	26	25
Right maxillary sinusitis	2	1
Chronic naso-pharyngeal catarrh	6	6
Chronic suppurative sinusitis	3	3
Coryza, Head cold, Catarrhal rhinitis	58	51
Influenza	2	1
Acute catarrh	4	3
Hypertrophic rhinitis	12	12
TOTAL	124	113 (91.1%)

* Eye, Ear, Nose and Throat Monthly *32*:512 (Sept.) 1953.

The Biomydrin formula

THONZONIUM BROMIDE 0.05%. Synthesized in the Nepera laboratories. Exceedingly potent antibacterial. Greatly enhances the antibiotic activity of neomycin and gramicidin. Reduces surface tension, facilitating spreading and penetrating. Mucolytic.

NEOMYCIN SULFATE 0.1%. Effective against gram-positive and gram-negative organisms.

GRAMICIDIN 0.005%. Effective against gram-positive organisms.

PHENYLEPHRINE HCl 0.25%. Widely preferred vasoconstrictor.

THONZYLAMINE HCl 1.0%. *Therapeutic concentration* of this effective antihistaminic aids in controlling local allergic manifestations.

- Prompt, prolonged shrinkage of nasal mucosa without secondary congestion.
- pH is 6.2. Isotonic and buffered.
- Does not interfere with ciliary activity.
- Spray covers larger area than could be reached by drops.
- Available on prescription only.

DOSAGE: Adults—2 or 3 sprays in each nostril; 4 or 5 times a day as needed, or as directed by physician. Children—1 or 2 sprays in each nostril; 4 or 5 times a day as needed, or as directed by physician.

BIOMYDRIN

"BIOMYDRIN" AND "THONZONIUM BROMIDE" ARE TRADEMARKS OF NEPERA CHEMICAL CO., INC.

Nepera Chemical Co., Inc. Pharmaceutical Manufacturers, Yonkers 2, N. Y.

Major advance in dermatitis control:

The new direct approach to the control of dermatitides is hormonal, enlisting the antiphlogistic and antiallergic potency of compound F—foremost of the corticosteroid hormones.

The new objective is adapting corticoid therapy to simple inunction treatment, and obtaining relief in various forms of dermatitides within days —sometimes within hours.

The new attainment is Cortef Acetate Ointment, which rapidly controls edema and erythema, halts cellular infiltration, arrests pruritus in such harassing skin problems as atopic dermatitis, contact dermatitis, pruritus vulvae and ani, neurodermatitis, and seborrheic dermatitis.

Cortef* Acetate Ointment

Supplied: *Cortef Acetate Ointment is available in 5 Gm. tubes in two strengths—2.5% concentration (25 mg. per Gm.) for initial therapy in more serious cases of dermatitis, and 1.0% concentration (10 mg. per Gm.) for milder cases and for maintenance therapy.*

Administered: *A small amount is rubbed gently into the involved area one to three times a day until definite evidence of improvement is observed. The frequency of application may then be reduced to once a day or less, depending upon the results obtained.*

*Reg. U.S. Pat. Off. for Upjohn's brand of hydrocortisone

A product of **Upjohn Research** *for medicine . . . produced with care . . . designed for health*

THE UPJOHN COMPANY, KALAMAZOO, MICHIGAN

A New, Versatile Compound for Control of

DYSMENORRHEA

THE MENOPAUSE

ASSOCIATED TENSION STATES

SELECTIVE RELAXANT

Dimethylane relaxes spasm and tension without sedative or hypnotic effect,[1-3] by blocking interneural transmission.

BROAD SYMPTOMATIC RELIEF

Dimethylane provides relief from tension and spasm within one to four hours. The relaxant effect of a single dose lasts for three to four hours.

Dimethyl

CAPSULES 2,2-DIISOPROPYL-4-METHANOL-1, 3-DIOXOLANE

DYSMENORRHEA, MENOPAUSE

In dysmenorrhea, *Dimethylane* gives gratifying relief from cramps, backache and tension.[1-2] In the menopause, *Dimethylane* relieves hot flashes, nervousness, dizzy spells, headache, fatigue, depression and irritability.[3] Supplementary estrogen therapy may be unnecessary.[3]

EXCEPTIONAL SAFETY

Dimethylane decreases muscle tone by action on the interneurons of the central nervous system. It does *not* cause sedation or hypnosis, and actually eliminates the need for barbiturates.[3] Toxicity has not been reported. Less than 7% of patients complain of nausea and regurgitation.[1-3]

DOSAGE

Two capsules after meals and at bedtime. Dosage may be reduced for individualized maintenance therapy.

SUPPLIED

Dimethylane is supplied in translucent green enteric-coated capsules containing 0.25 Gm., on prescription only, in bottles of 100 and 1,000.

ane

THE NATIONAL DRUG COMPANY

Philadelphia 44, Pa.

More than half a century of service to the medical profession.

REFERENCES:

1. *Vivino, A.E. and Ritter, G.: M. Ann. District of Columbia, 22:117 (Mar.) 1953.*
2. *Baines, G.J. and Horoschak, S.: Delaware State M.J., 23:183, 1951.*
3. *Baines, G.J.: Med. Times, 81:50, 1953.*

The new plastic bandage CURAD®

washes clean but won't wash off!

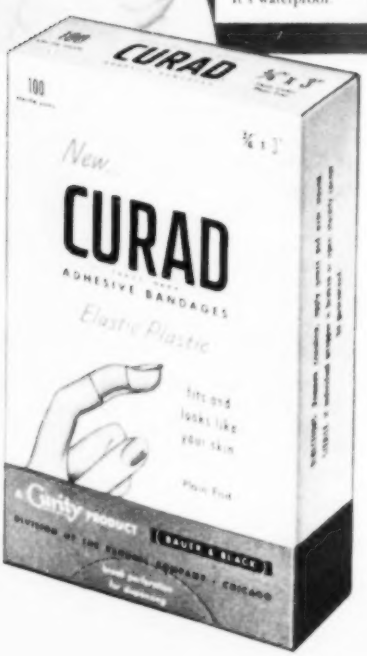
CURAD
PLASTIC
BANDAGE
Stays neat, stays clean and stays on—even in soapy water. Outlasts three old-style bandages. Paper-thin and elastic—fits like your skin.

OLD-STYLE
CLOTH
BANDAGE
Soon gets ragged and messy-looking. Not a CURAD! It has no cloth to catch dirt or ravel. Doesn't come loose in water. It's waterproof.

Now two types for professional use

CURAD PLASTIC BANDAGES 100's →
In handy dispenser box for desk or work table (also hangs on wall). 3" length in either ¾" or 1" width.

***New!* CURAD PLASTIC PATCHES 100's**
Here's CURAD waterproof plastic adhesive in easy-to-use patches. Available sizes: 1½" x 1½" or 1½" x 2".



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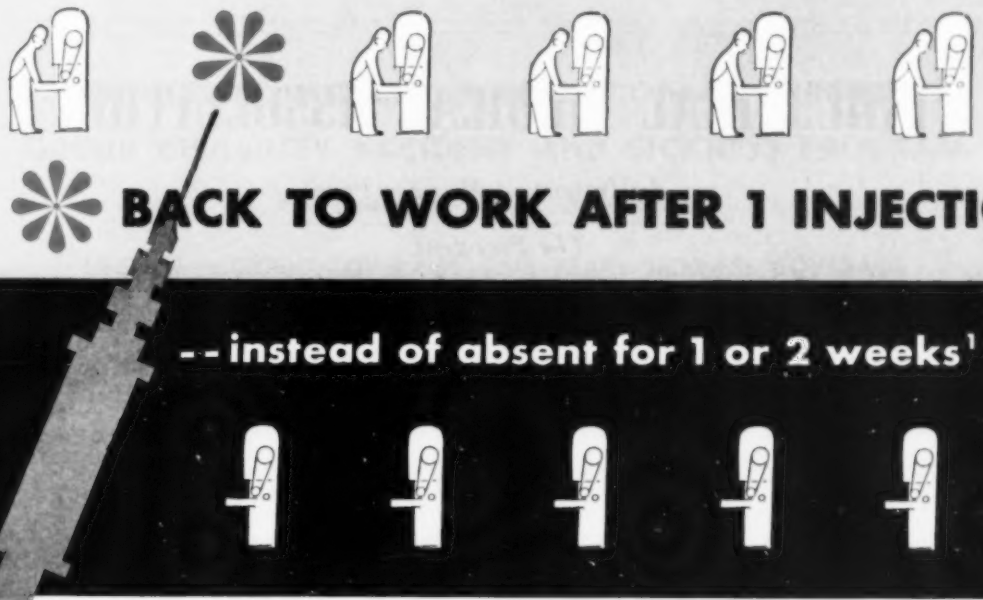

BACK TO WORK AFTER 1 INJECTION

--instead of absent for 1 or 2 weeks[1]

Natenshon[1] has recently reported the value of PHYATROMINE-H as a simple, effective office procedure for relieving pain and spasm in neuromuscular disorders. In traumatic myositis and strains, "the patient usually gets sufficient relief from one injection so that he can return to work instead of being off one or two weeks." Relief usually lasts for three days.

PHYATROMINE-H, containing l-hyoscyamine, gave a better therapeutic response with fewer side-effects than physostigmine-atropine combinations.[1] New evidence[2] confirms that hyoscyamine is twice as potent in its antimuscarinic action as atropine; it has, however, only one-half the cerebral stimulating effect,[3] and less tendency to cause mydriasis.[3]

Each cc. contains:

Physostigmine Salicylate	0.6 mg.
l-Hyoscyamine Hydrobromide	0.3 mg.

In isotonic sodium chloride solution

SUPPLIED: No.1742—1-cc. ampuls, boxes of 25; 30-cc. multiple-dose vials.

Complete Literature on Request

REFERENCES: 1. Natenshon, A. L.: M. Times 81:342, 1953. 2. Ward, J. W., et al.: Read before the American Society for Pharmacology and Experimental Therapeutics, Chicago, April 6-10, 1953. 3. Cushny, A. R.: Biological Relations of Optically Isomeric Substances, Baltimore, Williams & Wilkins Company, 1926.

STABLE..READY TO INJECT..WELL TOLERATED

Ethical Pharmaceuticals Since 1894
KREMERS-URBAN COMPANY
LABORATORIES IN MILWAUKEE

PHYATROMINE®-H

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[Brand of Physostigmine Salicylate and l-Hyoscyamine Hydrobromide]

A New Better-Tolerated Physostigmine Formula for Skeletal Muscle Spasm Due to Strains, Injuries, and Arthritis

PLEASE SEND ME:

. . . . . Professional sample vial of 5 cc. without cost or obligation.

. . . . . 30-cc. multiple-dose vials of PHYATROMINE-H at $6.30 per vial.

. . . . . 1-cc. ampuls in boxes of 25 at $6.30 per box.

(Quantity prices on request)

CHARGE ☐ ☐ C.O.D.

Name (Please Print)

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INDUSTRIAL MEDICAL ASSOCIATION

An Important Message From

The President

Why Our Entire Membership Should Enroll In The I.M.A. – Sponsored Group Disability Accident – Sickness Program

In April 1953 acting upon recommendations submitted by the Committee on Workmen's Compensation and Insurance, the Board of Directors of the I.M.A. approved Association sponsorship of a group disability accident-sickness insurance program for I.M.A. members, the program to be administered by the Joseph K. Dennis Company. This group program was made available in the I.M.A.'s endeavor to be of ever greater service to its members.

I am advised that as of August 1, 30% of the required enrollment necessary to include all active under age 70 members regardless of health history, has been attained. A larger enrollment is necessary if the group program is to accomplish all of its objectives.

Of course the need for protection and the desire to participate is an individual decision. However, your officers and directors believe that the benefits offered under this program are outstanding. Those members who have not enrolled to date are urged to re-study the informational material that they have previously received together with that appearing elsewhere on these pages.

It is hoped that all members see fit to avail themselves of this excellent opportunity for disability insurance coverage.

George F. Wilkins M.D.

George F. Wilkins, M.D.
President, I.M.A.

INDUSTRIAL MEDICAL ASSOCIATION—SPONSORED GROUP DISABILITY ACCIDENT AND SICKNESS PROGRAM

Exclusively For Members

LIFETIME ACCIDENT COVERAGE—FIVE YEARS SICKNESS COVERAGE

Plan	Regular Weekly Indemnity	Accidental Loss of Use of Hands Benefit	Accidental Dismemberment Benefit	Accidental Death Benefit	Annual Premium	Semi-Annual Premium
C	$ 50.00	$2,500.00	$1,000.00	$1,000.00	$ 99.50	$ 50.25
B	75.00	3,750.00	1,000.00	1,000.00	149.50	75.25
A	100.00	5,000.00	1,000.00	1,000.00	199.50	100.25

OPTIONAL ADDITIONAL COVERAGE—You May Add:

	Annual Premium	Semi-Annual Premium
WEEKLY HOSPITAL INDEMNITY — $10.00 per day — From First Day For 60 Days	$ 12.00	$ 6.00
ACCIDENTAL DISMEMBERMENT — Up to $9,000. Additional. Per $1,000	$ 0.50	$ 0.25
ACCIDENTAL DEATH — Up to $4,000. Additional. Per $1,000	$ 1.50	$ 0.75

SICKNESS BENEFITS PAYABLE UP TO FIVE YEARS — (Beginning First Day if Hospitalized — Otherwise Eighth Day)

ACCIDENT BENEFITS PAYABLE UP TO LIFETIME — (Beginning First Day)

"IMPORTANT" — Here is why every eligible member of the Industrial Medical Association should enroll in the LOSS OF INCOME GROUP DISABILITY PLAN.

1. Full benefits are paid regardless of any other insurance you may carry.
2. Replacement Income—Internal Revenue states A. & H. Benefits TAX FREE.
3. This is the most comprehensive disability plan ever made available.
4. No examination — world-wide coverage — confinement never required.
5. Premiums approximately 50% less due to purchase as a group.
6. Individual member coverage non-cancellable to age 70.
7. During this enrollment period the age limit is 69 for all applicants.
8. After the close of this enrollment period applicants limited to age 59.
9. Benefits are payable immediately after policy becomes effective.
10. Full benefits are payable for each period of disability (no aggregate limit).
11. Premiums never increase after issue.
12. Benefits never decrease after issue.

HERE IS WHAT YOUR I.M.A. PLAN PROVIDES:

	Plan "C"	Plan "B"	Plan "A"
1. Sickness and Accident Benefits Per Week	$ 50.00	$ 75.00	$ 100.00
2. Sickness and Accident Benefits Per Year	2,600.00	3,900.00	5,200.00
3. Sickness Disability Benefits for 5 Years	13,000.00	19,500.00	26,000.00
4. Accident Disability Benefits for 5 Years	13,000.00	19,500.00	26,000.00
5. Accident Disability Benefits for 10 Years	26,000.00	39,000.00	52,000.00
6. Accident Benefits Continued Even for Life			
7. Accidental Loss of Use of Hands Benefit	2,500.00	3,750.00	5,200.00
8. Accidental Dismemberment Benefit	1,000.00	1,000.00	1,000.00
9. Accidental Death Benefit	1,000.00	1,000.00	1,000.00
10. Annual Premium	99.50	149.50	199.50
11. Semi-Annual Premium	50.25	75.25	100.25
12. Cost Per Day	0.30	0.45	0.60

Doctor, if you will seriously consider the above we feel you will agree, for 30c, 45c or 60c per day you can't afford not to enroll.

Se'ect the amount you desire and please mail your enrollment card immediately.

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INDUSTRIAL MEDICAL ASSOCIATION
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with new "Super-

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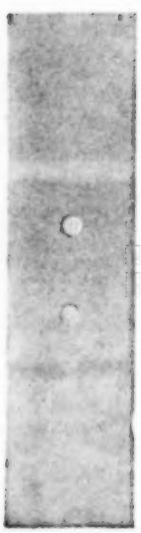

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Plastic Bandages

Stick"

They stick faster, stay on
better than any other bandages.

Johnson & Johnson

WOUNDS
BURNS
PERITONITIS

EFFECTIVE

Topical Chemotherapy

Sulfamylon is exceptionally active topically, is not inactivated by pus or blood or change in environmental acidity, and has shown no tendency to produce drug-resistant bacterial strains. Applied as wet dressing, by irrigation, by sponging or pouring into the peritoneal cavity in amounts up to 200 cc.

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Sulfamylon®

(4-aminomethylbenzenesulfonamide)

HYDROCHLORIDE

Winthrop-Stearns INC.

NEW YORK 18, N Y., WINDSOR, ONT.

Supplied

SULFAMYLON 5% SOLUTION
in bottles of 1 oz.
and 8 oz.

ALSO SULFAMYLON 5% SOLUTION
in bottles of 100 cc.
with vial of streptomycin
20,000 units.

SULFAMYLON 5% VISCOUS SOLUTION
for ear infections,
bottles of 1 oz.

Sulfamylon, trademark reg. U.S. & Canada, brand of mafenide

Topical Ointment of

HydroCortone®

ACETATE

(HYDROCORTISONE ACETATE, MERCK)

for Allergic Dermatoses

Topical Ointment of HYDROCORTONE Acetate produces rapid relief and local improvement in the following indications:

***contact dermatitis* (e. g., poison ivy), and**
***atopic dermatitis*, including**
eczematoid dermatitis, food and infantile eczema,
disseminated neurodermatitis,
and pruritus with lichenification.

Marked decrease in erythema, edema, and pruritus have been obtained without generalized systemic effects.

Supplied: As a 1% and 2.5% ointment, 5-Gm. tubes

Literature on request

HYDROCORTONE *is the registered trade-mark of Merck & Co., Inc. for its brand of hydrocortisone.*

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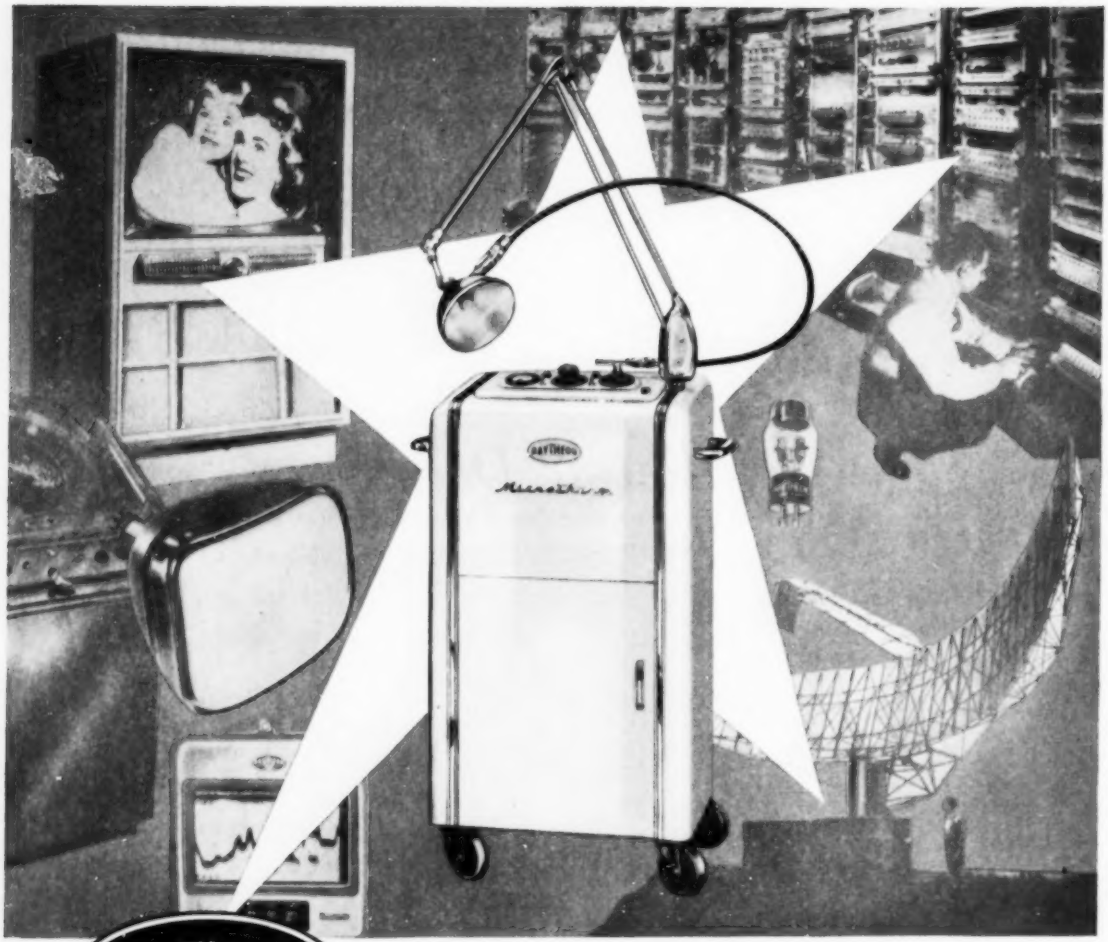

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MICROWAVE RADAR DIATHERMY

A shining example of RAYTHEON *Excellence in Electronics*

Over fifteen thousand Raytheon *Microtherms* are now in use in modern clinics, hospitals and doctors' offices throughout the nation.

This is a logical outcome of the pioneering and leadership in the field of electronic development and application that has made *Raytheon* one of the biggest names in this fast growing young giant of American industry.

Raytheon Microtherm Microwave Radar Diathermy is an ultra modern means of precision heat therapy.

Operating at 2450 megacycles it is far above the 920 megacycle television range, avoiding the TV interference problem.

Microtherm provides high clinical efficiency — penetrating energy for deep heating — dosage may be precisely controlled over large or small areas — nothing touches the body, no danger of shocks or arcs — safe, rapid, easy to apply and to duplicate treatments.

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You can buy Raytheon *Microtherm* with confidence

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RAYTHEON MANUFACTURING COMPANY

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for the first time

MEPHENESIN N.N.R.

plus

PHYSOSTIGMINE

with ATROPINE

Tolyphy

Chimedic

safe effective relaxation

of skeletal muscle spasm without loss of normal muscle tone or function.

Exerts the full spasmolytic action of Tolyspaz (Chimedic brand of mephenesin) plus the beneficial effects of physostigmine and atropine on the neuromuscular system.

TOLYPHY is specifically designed for the relief of pain, for increased range of motion and restoration of normal function in a wide variety of conditions complicated by skeletal muscle spasm or neuromuscular hyperirritability:

Arthritis, fibrositis, torticollis, bursitis, myositis, low back pain. In paralysis agitans the primary pathology in the central nervous system is often irreversible, but TOLYPHY helps bring relief from the stiffness, tremor, rigidity and painful muscle spasm.

Literature and samples of TOLYSPAZ and TOLYPHY available.

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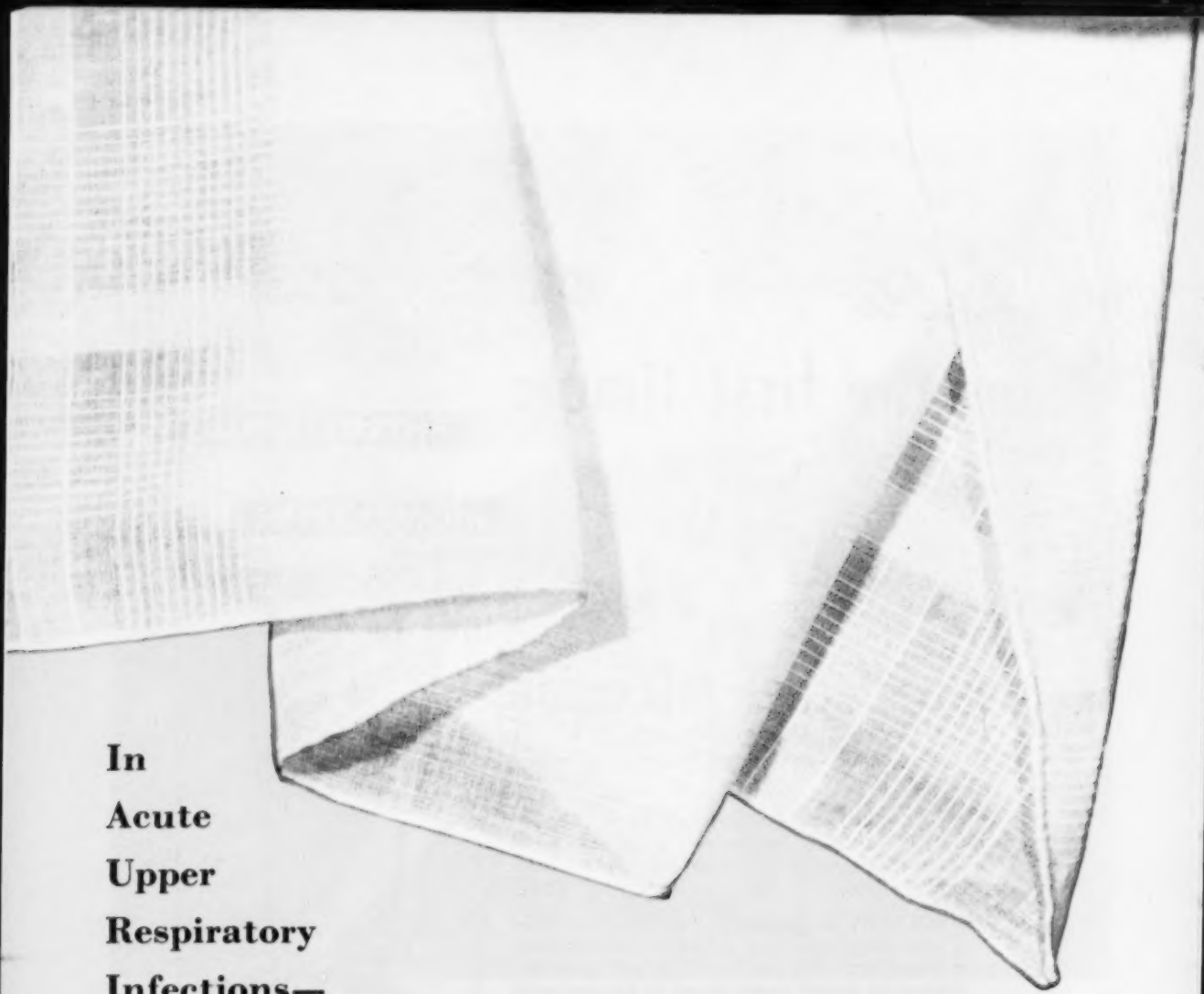

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1. Stephen, C. R., Nowill, W. K., and Martin, R.: Anesthesiology *13*:646 (Nov.) 1952.

2. Pickrell, K. L., Stephen, C. R., Broadbent, T. R., Masters, F. W., and Georgiade, N. G.: Plast. & Reconstruct. Surg. *9*:345 (Apr.) 1952.

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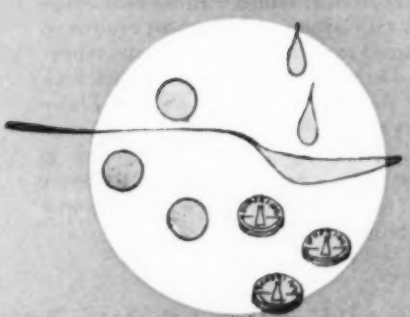

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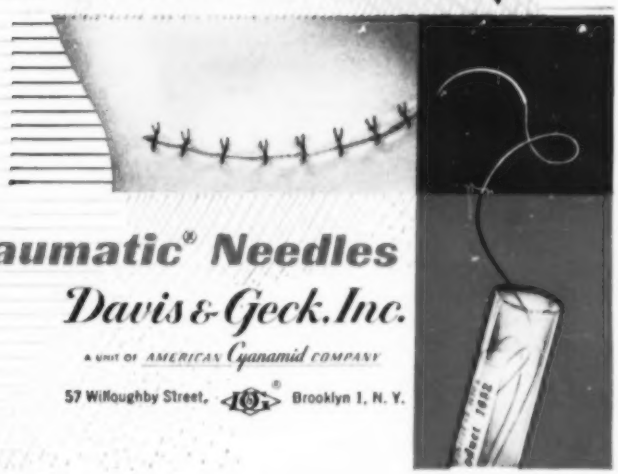

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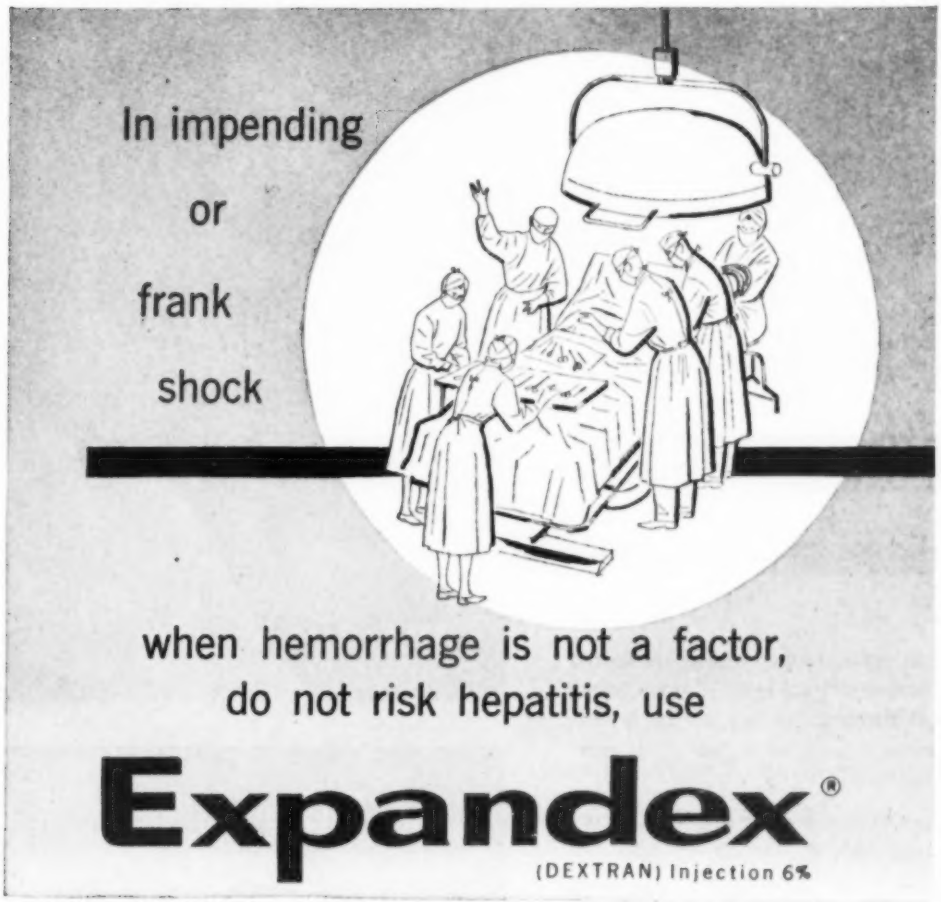

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**Ramsey, W. H.: Am. Pract. & Digest of Treatment 3:834 (Oct.) 1952.*

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**Naturally-occurring equine estrogens (consisting primarily of estrone, with small amounts of equilin and equilenin, and possible traces of estradiol) physiologically equivalent to 1 mg. of estrone.*

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VERATRUM ALBUM, a species of *Veratrum* indigenous to southern Europe, yields the ester alkaloid 'Provell Maleate.' 'Provell Maleate' is many times more potent than the mixture of substances from which it is isolated. Its uniformity and purity permit better control of the hypertensive patient than is possible with mixtures of alkaloids.

Hoobler* states that protoveratrine is superior to the alkaloids from *Veratrum viride* in that blood pressure can be reduced from six to eight hours daily without producing nausea, vomiting, or tolerance to the medication. The purity of the alkaloid allows for the accurate dosage so necessary to continuing good results over extended periods of time.

Careful adjustment of the dosage schedule to fit the need of each patient is mandatory. Overdosage may result in distressing, although usually not serious, symptoms. 'Provell Maleate' is a potent drug to be administered only under the close supervision of a physician.

'Provell Maleate,' 0.5 mg., is available in cross-scored tablets (to facilitate careful individualization of dosage) in bottles of 100. Your pharmacist has it. Be sure to evaluate carefully this important hypotensive drug. Ask the Lilly representative . . . or write Eli Lilly and Company, Indianapolis 6, Indiana, U. S. A., for more complete pharmacologic and clinical data.

**Annals of Internal Medicine, 37:465, 1952.*

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(PROTOVERATRINE A AND B MALEATES, LILLY)

Lilly

lowers blood pressure consistently, safely

INDUSTRIAL MEDICINE AND SURGERY

OCTOBER, 1953

To the Managements of Industry and the Physicians of Industry—

Good medicine is the same whether it be in the factory, in the city, or on the farm. Fundamentally, the doctor recognizes his responsibility to keep people well, or to promote rapid recovery from sickness or injury, regardless of cause. Medicine as a whole recognizes its responsibility to industrial workers through the ministrations of its general practitioners, its industrial physicians, and its consulting specialists. Through the agencies of medical organization—the Industrial Medical Association and the Council on Industrial Health of the American Medical Association—we are steadily making progress in the formulation of adequate standards and in the provision and maintenance of proper workshops and health facilities. We are fully aware that the principles of prevention are paramount. They are the ultimate solutions for the most pressing of industrial health problems, whether they derive from the work itself or from external influences. While we focus our professional minds on the shop and factory, we must also think of the home and the free hours of the worker. Our aim must be an over-all perspective.

My own observation convinces me that the elimination of occupational hazards and diseases, and the treatment of the industrially sick and injured are on the whole proceeding well and that the rates of future progress will be even more greatly accelerated.

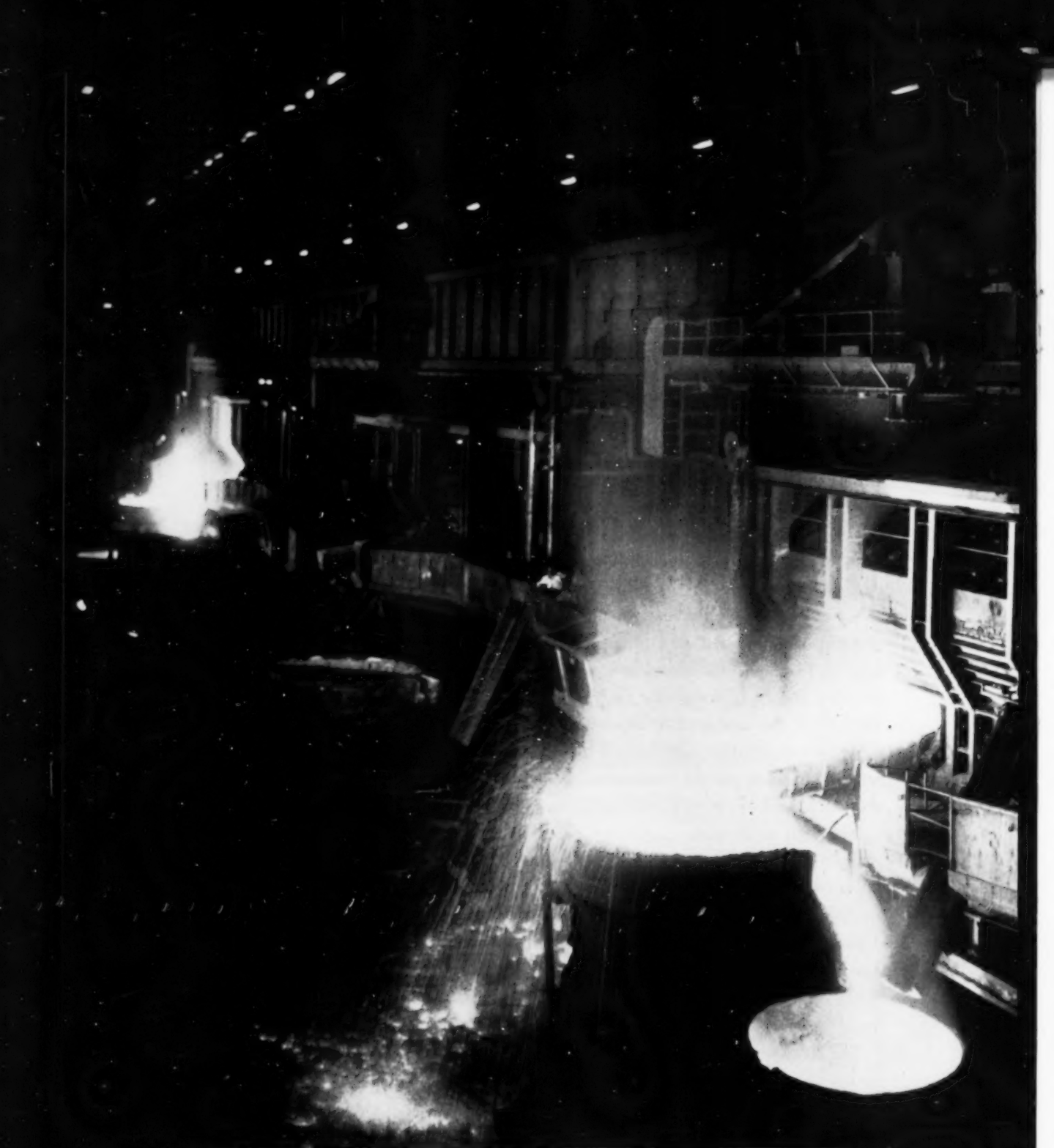
I believe that in our country we have arrived at a very commendable health status for the great majority of the people. We cannot think of industry or medicine reaching present goals under any form of dictatorship. As we press forward in our effort to improve the health and welfare of workers in our factories and in other aspects of community life, we must also seek to defend them against the encroachment of any system which could destroy the gains made by industry, by labor, and by the scientific professions.

The horizons of medicine are unlimited in a free world. Its past accomplishments and future triumphs will inevitably be reflected in industrial progress and in the economic outlook of our country. If free medicine is injured, then, if I am a student of history, we can anticipate destruction of free and independent labor and industry.

I am glad to present to you on this occasion my sincere felicitations. Truly, Industrial Medicine has come of age.

Edward J. Stieglitz

President
AMERICAN MEDICAL ASSOCIATION



"Iron-works, forge-fires in the mountains, or by river-banks, men around feeling the melt with huge crowbars—lumps of ore, the due combining of ore, limestone, coal—the blast-furnace and the puddling-furnace, the loup-lump at the bottom of the melt at last—the rolling-mill, the stumpy bars of pig-iron, the strong clean-shaped T rail for railroads."

—Walt Whitman

Twenty-One Years

TWENTY-ONE years ago, on October 5, 1932, the first issue of *Industrial Medicine* made its appearance. The event was not world-shaking. No splash rippled the economic tide. No echoes bounced from the declivity of the "big depression." A small happening, it drew small comment: "Another medical journal?" Was not the field already fully served? "Poor timing!" No moment less propitious! "The omens scowled; the augurs shook their heads." But there the new Journal was. And now, on its twenty-first anniversary, here it is. The event did have significance; the timing was right. The proof is a matter of retrospect. . . .

The Nadir

1932: On the national tableau, business was on its back looking up—inert. People were marking time; there was plenty of it to mark, the year passed slowly. Fifteen million workers were unemployed; a voluntary wage reduction of 10% was accepted by 1,500,000 railway employees at a Chicago conference; Jimmy Walker resigned as Mayor of New York, and sailed for Europe; the first movies in technicolor were shown; the Yanks took the World Series, four straight; President Hoover asked Congress for a $4,218,803,334 budget; Fred Frame won the Indianapolis Race at 104.14 mpm; the neutron was discovered; Hitler was offered the Chancellorship of Germany. It seemed the major event that the political opportunists rode into power on a wave of false hopes engendered from false promises. It seemed only minor that in 1932 sulfanilamide, previously a dye, was "rediscovered" as a drug. In the light of the after years, the "antimicrobial era" ushered in by sulfanilamide, the first of the antibiotics, assumes its true perspective.

It was a quiet year in industrial medicine. DON LOWE (1883-1946), Medical Director, B. F. Goodrich Company, was President of the American Association of Industrial Physicians and Surgeons (now the Industrial Medical Association). The financial climate was not friendly to Association activities. There was no Annual Meeting. DR. LOWE held over for a second term, and, again, for a third. Things were to get worse before they got better. The union of management and medicine had done well during the "for better" period; would it survive the "for worse?" It would. Men were thinking, and theirs were long, long thoughts. Some wrote; and the years have shown they held the pens of prophecy. Anticipating the deluge of silicosis claims that was quickly to stagger the managements of heavy industries, SAPPINGTON (1889-1949) published his "Silicosis and Other Dust Diseases"; GARDNER (1888-1946), his "Inhalation of Quartz Dust"; MCCORD, his "Silicosis in the Foundry." GEHRMANN struck the keynote of the future in his "Prevention of Lead Poisoning in Industry." HENRY FIELD SMYTH unerringly forecast the conditions that were to become a tumult of deafness before they would be taken seriously, when he wrote about "Noise in Industry: Its Effect on Hearing and General Health." MCNALLY fomented a controversy which has proved to have no ending, in "The Tar in Cigarette Smoke." HART FISHER seemed ahead of his time in his studies of "Electric Shock." Meanwhile the American College of Surgeons gave the year a certain tangibility. It surveyed 174 industrial medical departments and in 1932 first bestowed its ACS "Certificate of Approval" which, for almost two decades, was to serve as the accolade of excellence in industrial medicine. Seventy-four medical departments were awarded the Certificate that year.

Technology

THE industrial medical significance of 1932, however, had its roots in deeper meanings. Time was snail-paced. Looking back, it appears that time was resting, gathering courage to meet, and strength to cope with, something it sensed but couldn't name. Time was afraid. Soon would come the phenomenon that was to destroy its measured values. Technology—pouring out its miracles of mechanics and electronics, seeing in the hidden dark, singing in the far-off silences, dissecting the invisible atom, imposing its units of use upon infinity—this was shortly to set about the confounding of time, collapse its eras, telescope it upon itself, and make it go so fast that men live in tomorrow while they breathe today. This phenomenon that would "amaze, indeed, the very faculties of eyes and ears," was to impose a strange and unusual demand upon industrial medicine: *henceforth it must keep abreast of both medicine and technology.*

This was a large order. Men were to work in strange surroundings; the techniques and materials of technology in the places of its making were to create new atmospheres, new hazards, new exposures, new requirements of safe and

immediate adaptation. The technology of the future would be reflected in products, but the technology of the factories and laboratories which would spew them forth was to be even more technical than the products themselves. As always, men were to bring to their work their human potentialities of needing the "medicine" of healing, but in the places of their work they were to need more—they were to need *industrial* medicine. This concept evolved its own name: "prevention."

By no means is it implied that "prevention" as the "touchmark" of industrial medicine, began in 1932. The preventive idea has a long history. One small facet of its genesis is described by ANDREW HARVEY (1868-1949), Medical Director, Crane Co., Chicago, 1896-1936: "During the years 1890-1900, Mr. (R. T.) Crane was a strong advocate of industrial concerns looking after their help. Many of the heads of such companies spent their summers at Lake Geneva, commuting at week ends; they congregated in the parlor cars, and here Mr. Crane preached his ideas. I think N. K. Fairbank, President of a big soap company at that time, was a convert, and others became interested so that between 1900 and 1915 I had many inquiries about our medical set-up."

ANDREW HARVEY was the first Medical Director in the United States (appointed June 1, 1896). His confreres in industry during the next two decades were known mostly as Chief Surgeons. Gradually, as the preventive concept grew, there were more Medical Directors. In 1932 about half of the IMA members had that designation. Now, except on the railroads, the title "Chief Surgeon" is rare; "Medical Director" carries the modern implications—in name as well as in fact.

"Nunc pro Tunc"

THE LAW profession has the phrase "nunc pro tunc." Using it with reference to 1932, it may be said, "now for then," that the year was near the center of the transition that has evolved the complex technology of today; at least the beginning point of its overwhelming up-sweep. Managements may have been marking time, but they were planning, even while they waited. Looking back from what they have done, it is possible to imagine what they were planning. Unwittingly, they were getting ready . . . . for something that then had no shape.

It may be imputed to 1932 that it was about the time when industrial medicine became aware of the new and unusual demand that was to be made upon it with respect to technology. How it responded, and to what extent it has taken its place at the right hand of management is tied in with a second unusual requirement. Even in 1932, technology had outrun time; but more, it had far outdistanced the ability of mankind to absorb it. In the deliberate processes of evolution, always there had been a lag in man's adjustment to the new. He approached it gradually, sometimes reluctantly; became accustomed to it slowly. The path of the plodding ox was thousands of years long, and of the patient horse, centuries. Then came the railroads, and after a hundred years man had grown used to them as the arteries of his economy. But suddenly the world was awheel; the self-propelled vehicle was threading the capillaries of his life. Speed was his servant; his to control. With it he could pace the technical, overtake his lag. A comparison of traffic accidents as between the ox and the automobile need only be suggested to point up the fact that man is still unable to absorb his technological developments as fast as he produces them. He cannot yet take them in stride. He responds with stresses and strains new to his physical capacities, and with reluctances new to his mind.

So fast is the rate that before he can adapt himself to one epoch-making development, more demand attention—not only as to use, but also as to manufacture. Processes, materials, machines, precisions, calculations, experiments, extremes of the vast and the minute, cold and heat, noise and silence—all these in their myriad combinations impose upon the human frame strange tensions, in addition to "the thousand natural shocks that flesh is heir to." And thus the second unusual demand upon industrial medicine was to be that it study *man*—inquire not only "of what trade is he?" but over what background was his ontogeny spread. Medical science, technical science, social science—each with relation to the whole man and his place in his teeming environment, each distilled for pin-point application to the individual human being—these became the industrial physician's assignment.

Management

THIS assignment was not derived from governments, laws, compulsions; it came from management. Its motivation sprang from management. But what is management? Management is men—business men, individualists, pioneers, dreamers, creators—administrators and executives, dealing with people and with things; directing and managing the free enterprise that has made the nation; planning for other men whose jobs and whose money are in their care; shouldering their responsibilities throughout the work-day hours, carrying them home in their brief cases, their minds—their hearts. The year 1932, low point of the depression, was close to the time when it began to be appreciated that no more would exist the sharp dividing line between employers and

"their help"; that the men of management, like "their help," were also human beings—with nerve, brains, vigor, skill, power, stamina—and with "nerves," ulcers, hypertensions, headaches, anxieties, and the effects of worry; listening, learning, thinking, leading, driving—and driven; men in the various echelons of office from president to foreman, each in his separate sphere . . . . human beings all.

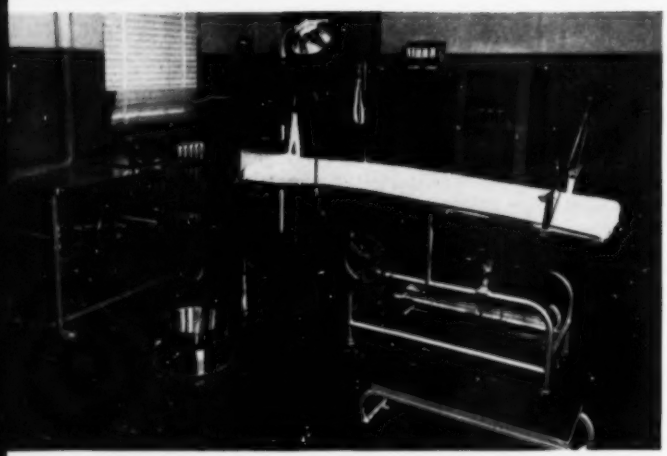
Management is men. But also, in broader meaning, management is what those men do. They are "good managers" in proportion as they recognize "good business." In the 1890's "R. T. Crane, Sr., thought it 'good business' to have a full-time Medical Director, having in mind little more than surgical and medical emergencies." The quality of the "good" was conditioned to the time. Then it was "good business" to invoke the common law defenses; now it is "good business" to prevent the injuries. The meaning of "good" has had its own measures of progress. Management has discovered that as its functions pass down the line—president, to vice-president, to department head, to supervisor, to foreman—they finally rest upon the untitled employee at the bottom—to the extent that he has to manage himself. If he does this well, it is reflected on up to the president's office. If he does it poorly, top management suffers. Good management, therefore, is interested in his doing it well. He cannot be ordered to do it well, or penalized for not doing it well. It is a sound assumption, however, that he wants to do it well, and experience has shown that he will respond to efforts to help him do it well.

The "well" is important, because he is unable to do much about it when he is not "well." This touches upon the common denominator of all jobs, the humanness of those who fill them. Humanness is never more manifest than in the presence of the physician. Here the industrial physician's assignment becomes specific; here he brings to bear upon the human being before him, in special personal application, his knowledge of medicine and the technologies and humanities of industry. With relation to the human being in employment it is the industrial physician's assignment to keep him well when he is; to get him well when he isn't; to help fit him to his work and his work to him; to see that his is a wholesome working environment; and to be ready and able to advise him as to the physical and emotional management of his personal self in his work relations, his home relations, and his community relations. The industrial physician has done well with his assignment. Already he has come a long way toward the goal of establishing for each employee, that "unity of mind and body" which will enable him to live happily within his individual powers of adaptation. The result has been that thousands of top managements have found it "good business to sustain a full-time Medical Director." This exemplification of "good business" needs no explanation, no apology, no defense.

Fait Accompli

1953: During the 21 years of the life of this Journal, industrial medicine has grown to huge proportions in size, and to unchallenged definiteness in fact. In 1932, its protagonists lectured and wrote in terms of "ought" and "should": "the industrial physician ought"; "the Medical Department should, etc." Now, in 1953, it is a *fait accompli* that the industrial physician IS; the Medical Department IS. The protagonist of yesterday has been succeeded by the practitioner of today. And the practitioner of today is a specialist. This is true in a double sense: as a physician he is a medical specialist; as a Medical Director, he is also an industrial specialist—an executive, in an industrial position no one but a medical specialist can fill. This Journal has watched him grow; has grown with him; perhaps, in a small way, has helped him grow. Month by month it has recorded his activities, his achievements, his progress. Always his advocate, his champion, it has held firmly to its belief that he would arrive where he is. Proud of its long association with him, and of its opportunity to speak of him and for him, this Journal now endeavors to signalize his attainment of "the full strength of years," together with its own attainment of majority, by depicting, within the inexorable restrictions of space, just where he is, and, to some extent, how far he has come.

This portrayal is not a history. The annals of industrial medicine are in capable hands; they are being set down in full and careful form by several historians. Neither is it a survey or questionnaire summary. Such are necessarily incomplete, and, though often informative, reveal little and prove less. They lend themselves to criticisms of industry—the burden of which seems mostly that because the best in industrial medical service is not universal, the whole of it is to be condemned. Overlooked, or ignored, is the fact that *there are thousands of medical services in industry, management inspired, medically superior, doing magnificent work in quiet competence, and taking it all as a matter of the day's fulfillment.* So many are they that merely to list them would more than fill these pages; to describe them, however briefly, would be a cyclopedic undertaking. Neither will be attempted here. Instead, the Editors endeavor to picture Industrial Medicine AS IT IS. They "paint on a ten-league canvas"; the appreciative eye and the understanding mind will fill in the details. . . .



THE MEDICAL DEPARTMENT

ATLAS POWDER COMPANY

VOLUNTEER ORDNANCE WORKS

Chattanooga, Tennessee

JAMES A. SELIGMAN, M.D.,
Company Medical Director
(Wilmington, Delaware)

JAMES P. WALLACE, M.D.
Chief Plant Surgeon
(Chattanooga)

Above is the Clinical Laboratory. The equipment is of sectional steel; flat tops and reagent shelves are of stainless steel.

At the top left is the Examination and Treatment Room.

Next (left) is the Surgery.

Third (left) is the Physical Examination and Minor Treatment Room.

At the bottom left is the Emergency Treatment Room, with flat steel treatment table and oxygen equipment for serious injuries.

Below is a two-bed Recovery Ward.

Right (opposite page) is the Sterilizing and Utility Room.

Stainless steel, aluminum, and woodgrain finish metal are used throughout. The walls are soft colored, grey-green predominating.

All equipment furnished by A. S. Aloe Company, St. Louis, Missouri.

The Medical Department.

INDUSTRIAL MEDICINE'S *raison d'être* may be expressed in simple terms: Man + Health = Job. This is a long—but rapid—progression from the time-worn formula: Man = Job. That formula survives in few places; its most obvious persistence is in the military detail: "Sergeant, take 10 men. . . ."

The difference is between the old days of the "labor pool," and the modern days of selective placement based on fitness; the old days of manual labor, and the modern days of the machine; the old days of "medical and surgical emergencies," and the modern days of "preventive medicine." The contrast is vivid, and the change came fast. The water wheel is still the scenic neighbor of the turbine; the giant caterpillar earth-movers are freighted on railroad banks heaped up from "borrow pits" dug with spades. The strong back and the steady hand are still needed—for even in its utmost refinements technology is man-made and man-operated, and the human is still the common denominator of its many jobs. Technology has put the strong back and the steady hand to brain-directed use. But it requires that the back continue strong, the hand remain steady, the brain be clear.

In short, Technology, the essence of industry, requires Health. Hence the Industrial Medical Director, and his area of service—the Industrial Medical Department.

HEADQUARTERS for Health! That is the Medical Department. In the abstract, health is complete physical and mental and emotional well-being. Industry, however, makes a concession to the vicissitudes of life in that this well-being can be less than complete; it requires only that the possessor of whatever well-being is his human portion have enough of it to be able to work. It begins its interest in health at some point above the raw negative which is represented by:

Man + No Health = No Job.

INDUSTRY'S formula is:

Man + Some Health = Some Job.

At the starting point in industry—where Man becomes Worker—the Medical Department measures the extent of the "health" and thereafter devotes itself to maintaining it—to the end that its possessor may continue in the full enjoyment and usefulness of what he has, whether it is all or only some.

In facilities and equipment the Medical Department has everything that can aid in the restoration and the maintenance of health, and everything that will contribute to the prevention of ill health is included in its armamentarium. Its architecture is excellently planned; its furnishings and appointments the most modern; its uses of space and adaptabilities in convenience marvels of careful thought. In emergency response it is the equal of the hospital. In diagnosis it is on a par with the best-known clinics. In the treatment of conditions attributable to industry it leaves nothing untried that medical science can offer or medical skill can do.

This is the *good* Medical Department.

THIS is not one Medical Department, but many. The number of good Medical Departments throughout the United States is much larger than is generally known. As to these good Medical Departments, the foregoing is a description of each. As to the others, it is a composite of all. The extent by which any one of the "all" is short of the complete picture is the measure of that one's opportunity.

Medical Departments are all alike, yet not all alike. They differ according to a variety of factors in their respective employment situations. These factors include the size and type of the industry, its technologies, its geographical location, its percentage of older employees and of women, its liability to toxic exposures, the accident hazards in its kind of work, the community facilities, and the caliber of the local practitioners. Other factors may include the absenteeism rate, the type and frequency of accidents, the rehabilitation problem, together with special problems re-

lating to health which may arise from the kind of work in which the plant is engaged.

But whether the plants are making textiles, steel chemicals, automobiles, wire, tools, the Medical Department in each one resembles in certain fundamental respects the Medical Departments in all the others. In these respects all Medical Departments have their own common denominators. These have been carefully defined by two important agencies, the American College of Surgeons, from 1932 to 1950, and the American Foundation of Occupational Health since 1950. The places of these agencies in the developments of the last two decades, together with the contrast in their respective bases of evaluation of medical services in industry, are described elsewhere in these pages.

"Let those not yet convinced that Medical Service in Industry is one of the most important factors of production find an answer to this simple question: Can they obtain more production at lower costs if they cannot count on physically and temperamentally sound people?"

—DR. J. A. JUNQUEIRA, Southern Division Medical Office, Standard Oil Company of Brazil, Sao Paulo, Brazil.

THE majority of workers possess more than a "little health." They go from the Medical Department to their places of work and do not quickly return. They continue healthy. Little in their consciousness is the fact that their work environment is wholesome because of the physicians and hygienists who have the responsibility of keeping it so. But neither in appropriate preplacement physical examination nor in providing a secure work environment has the Medical Department fulfilled its obligation to the worker. For, healthy today—tomorrow something else. Objectively, an accident, an allergy, a new material with unforeseen toxicity; subjectively, an added responsibility, another worry, a physical symptom—and the Medical Department becomes the center of interest. The worker needs return to the Medical Department, not only for the occasional minor injury, not only for the rare acute upset, but also for the major effort—*the perpetuation of health*. The seeds of future disease disaster early are sown even in the apparently healthy. Those seeds submit to detection at their first sproutings.

Then promptly into action go medical queries: "Who" and "What" and "Where," and "How" and "When" and "Why," and each, as it applies, is followed to its answer. Unlike the hospital, the Medical Department does not stop with the cure and dismissal of the patient. There was a cause of the worker's need for the services of the Department. If it was an industrial cause it must be found and eliminated; a recurrence must be prevented. Unlike the hospital and unlike medicine outside of industry, the Medical Department—as to each of the workers within the industrial environment it serves—is interested not only in the condition in which something is wrong *but also, and equally, in the condition in which nothing is wrong.*

Technology requires Health; management requires that the science of Health in Industry take its place alongside the sciences of the things involved in its technology; the modern Medical Department is the arena in which the science of Health in Industry finds its brilliant manifestation.

IN ITS association with management, the Medical Department occupies two places, one physical, one functional. As to the first, it has a corporeal structure—rooms, offices, floors, walls, ceilings—presenting a compact unit, not remote and formidable, but part of the plant—nearby, accessible, approachable. Its area, however, is not the extent of its function; its walls do not confine its influence. Within the limits of the industrial environment, the Medical Department in more ways than one is "just around the corner."

As to its functional place, the Medical Department appears somewhere on the organization chart. "Really big managements have their Medical Departments reporting directly to the president or to a vice-president." One instance is notable in that the Medical Director reports to a designated member of the company's Board of Directors. Another is of record where the Medical Director was told by the president: "You don't report to anybody." But wherever the Medical Department may appear in the carefully drawn outline of the delegation of author-

"How effectively or how badly a Medical Department functions should be one of the many useful yardsticks for directors when they are wondering whether the company needs a new head.

—WILLIAM B. GIVEN, JR., Chairman, American Brake Shoe Company, in "A Better Place to Work."

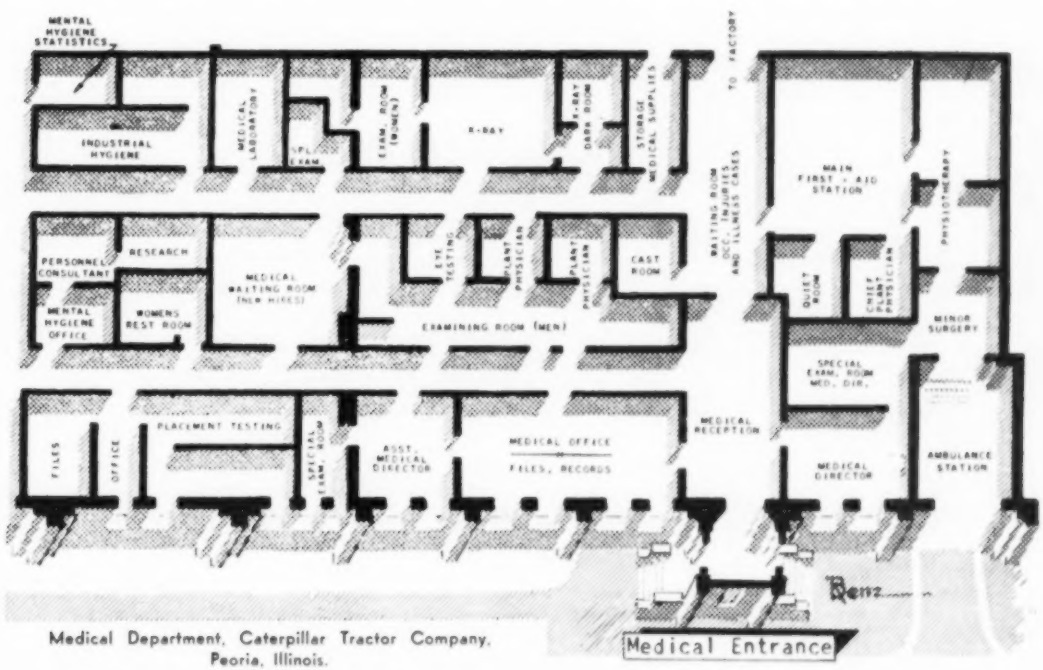
ity, there is a certain logic involved in the decision as to where it should be. Usually the boundaries of a management function are the boundaries of the department that exercises it. Each department has its own area of influence, and the success of the enterprise depends upon the smooth fitting together of each with the others. The effectiveness of this functional coordination is the responsibility of top management. Since the industrial environment is the sum total of all departments and their functions, the boundaries of top management's function are those of the whole environment; it alone has no organizational demarcations.

THE Medical Department, of course, is a department. It has its own equipment and procedures, its own staff, its own records and reports. In this it is like all other departments. But it differs in function. The other departments, so far as the workers are concerned, are interested primarily in what the individual worker does; their departmental functions are expressed in accomplishment, work finished, schedules met —the collective results to which the worker's efforts contributed. These things reflect many different kinds of jobs, but all these jobs are numerators of the industrial fraction each worker represents in his relation to his department. The human being, the worker himself, is the denominator. The Medical Department's primary interest is in the denominator, the human. It concerns itself with what he *is*, and its interest

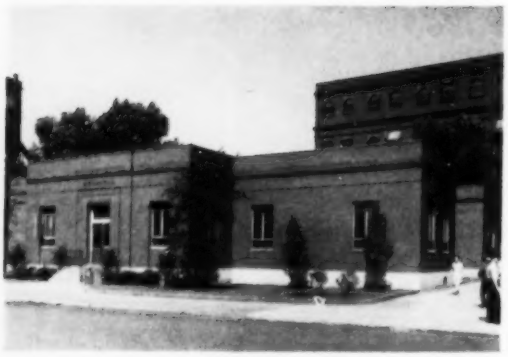
Baton Rouge Medical Department. Refinery, Standard Oil (New Jersey), Baton Rouge, Louisiana.

encompasses every worker, in whatever department. It knows no boundaries except those of the industrial environment. It has no limitations within the scope of its function: "Keep him well when he is; get him well when he isn't"—regardless of what he does or where he does it. This function cuts across departmental segregations, ignores charted lines, and—like that of top management—its influence reaches into the farthest corner of the work situation.

Thus the Medical Department, while still a department, has certain of the qualities of top management. These are inherent; without them, the Medical Department would not be a Medical Department. And thus its place in the organization outline is a little difficult to determine, because



Medical Department, Caterpillar Tractor Company, Peoria, Illinois.

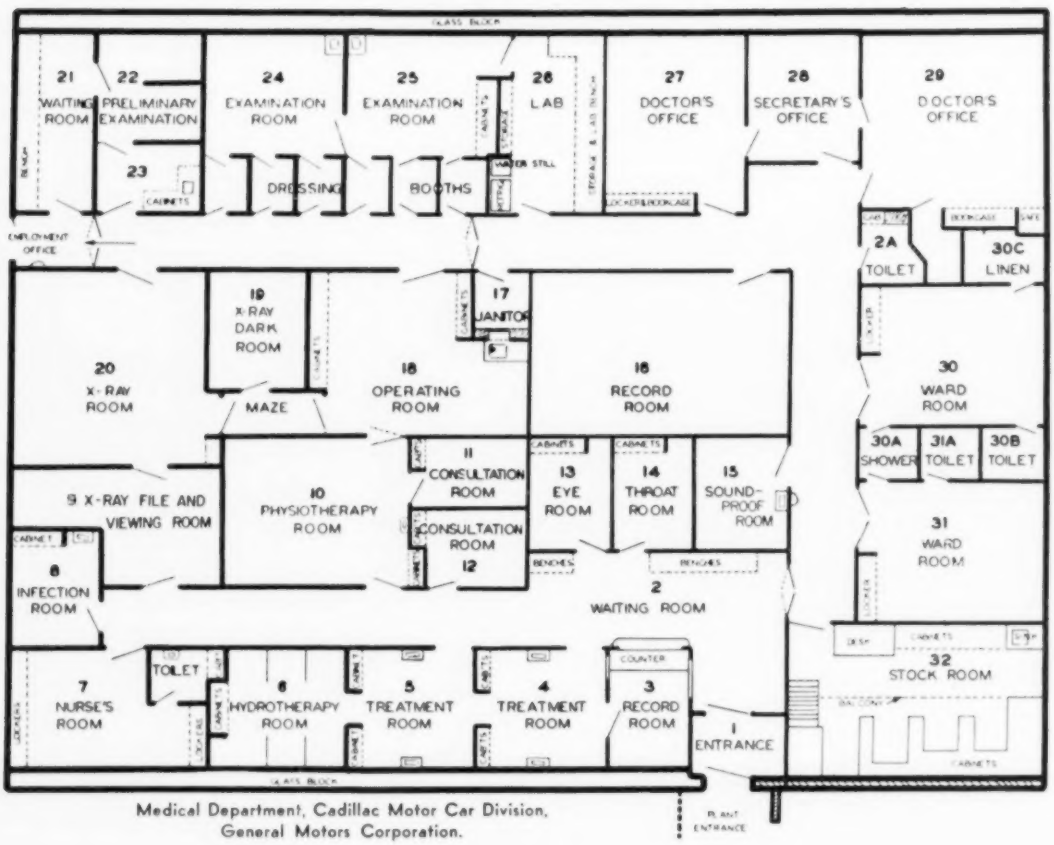


Bethlehem Steel Company Hospital,
Bethlehem, Pennsylvania.

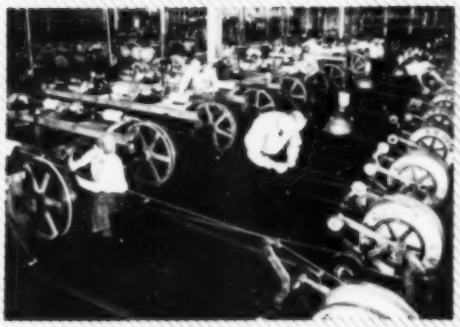
logically it has no place, but all places. "Man + Health = Job" applies to every man and every job. The Medical Department, in the matter of "Man + Health = Job," covers the whole industrial environment. In the broader picture, therefore, "the position the Medical Department occupies on the organization chart is of less importance than the level at which it establishes itself in the discharge of its function." Whatever its charted place, it will be successful if it has the backing of recognized authority. Where this authority is lacking, there comes the realization sooner or later that the services of the Medical Profession are not amenable to direction "through channels."

The Industrial Environment

The Medical Department is not a thing apart. For everyone in the environment, from president to untitled workers, all paths lead to its door—and the door swings both in and out . . .



Medical Department, Cadillac Motor Car Division,
General Motors Corporation.



PRESIDENT

SECRETARY | TREASURER | COUNSEL | CONTROLLER | AUDITOR | ASSISTANT

INDUSTRIAL RELATIONS
- PERSONNEL
- SAFETY
- EMPLOYMENT
- TRAFFIC
- DEVELOPMENT

- PUBLIC RELATIONS
- ADVERTISING

SALES
- RESEARCH
- ENGINEERING
- PURCHASING

OPERATIONS
- MANAGERS
- SUPERVISORS
- FOREMEN

THE UNTITLED

A photograph stands somewhat intermediate between a man and his work. As to the Industrial Physician, never can there be any proper photograph—for he, in his response to the requirements imposed upon him, is not just one man but seven or a dozen. Here he is, this man of parts—a composite of

Seven Distinguished Industrial Physicians

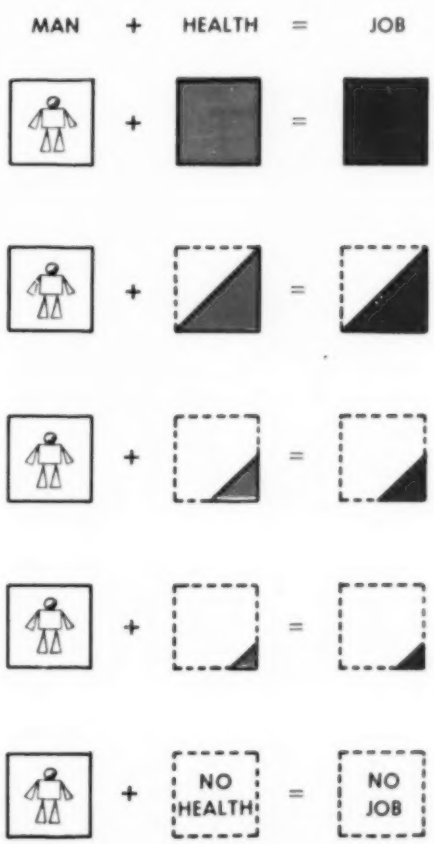
The Medical Director

PHYSICIAN—first, and always. And, as physician, his own man. Thoroughly educated, finely trained, serious minded, practical from having been made to prove his worth as he has so definitely proved it, visionary in that he has ideals of broader service ahead—this is the Medical Director. He is a career man. He is imbued with the philosophy of constructive medicine, and is conversant with the nature and purposes of industry and with the technologies of its means of production. "He moves with facility among machines, materials, manpower, products, processes, and program group enterprises." His daily outlook is the panorama of work; he sees it and understands it in terms of the workers who do it. He sees them and understands them in terms of the assignment with which his function is charged. "Worker + Health = Job" is the formula; he is the trustee of its integrity. His daily routine is the expression of a characteristic of industrial medicine impossible in other practice: *his contacts with his people do not end in an act, but continue with an interest.* "In sickness and in health" were the words of his vow; the injunction "Physician, heal" is no more important to him than the requirement "Worker, hale." The double duty involves time and money, but management sees to it that he has both.

Health is always relative, never absolute. Nowhere is its relativity more apparent than in the industrial environment. There it becomes a matter of individual effectiveness. What does the worker bring to his work in the way of capacity to do it? Where can this capacity be used to the best advantage of both work and worker? How can it be preserved, safeguarded, maintained—injuries avoided, exposures controlled? How can the worker be helped to keep what he has in order to be able to continue doing whatever it is that he can do? Industrial medicine here is "preventive" medicine. But the mere preservation of the *status quo* is too much a negative concept. Industrial medicine goes farther, becomes positive. How can the individual effectiveness be enhanced? Eyes, teeth, diet—health education? Industrial medicine here is "constructive" medicine.

Reparative, *preventive*, CONSTRUCTIVE—that is industrial medicine today "in thousands of medical services in industry, management inspired, medically superior, doing magnificent work in quiet competence, and taking it all as a matter of the day's fulfillment." And each of these medical services is the long shadow of the Medical Director at its head. . . .

SIMPLE as the philosophy of industrial medicine may seem in theory, or in outline, its practice is highly complex. The little-changing, slow-adapting human equation distributed among the fast-moving technologies of the industrial environment gives rise to a whirling kaleidoscope of problems. In their totality, these are more than a collection of ills; they are a segment of life, a gamut of human experiences—problems of body, mind, emotions, temperament, reactions, interests, capacities, handicaps, personalities, habits—in any of their thousands of combinations. In whatever form they present themselves, the Medical Director must deal with them. His rule is "employee first; employer second." The fact that there is the "second" is another distinctive characteristic of the industrial medicine he practices.

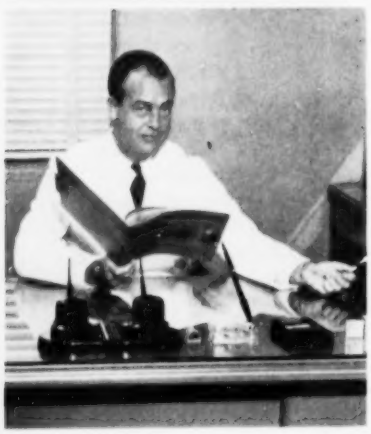


As head of his Medical Department, the Medical Director exemplifies industrial medicine in its fullest application. Here he is not only physician; he is also executive, sci-

The Medical Director—

Administrator of the Agencies of Prevention

Whatever the technology—airplanes, aluminum, automobiles, brake shoes, glass, insurance, oil, potteries, printing, public utilities—and whatever its potentials of injury or occupational disease, the Medical Director long ago ceased waiting for the case in order to recognize the hazard.



A Medical Department Clinical Laboratory.

entist, researcher as to causes and effects, administrator, investigator as to facts, experimenter, diplomat, listener, counselor, confidant, teacher, humanitarian, toxicologist—and often statistician. Withal, he is wise, patient, kind, understanding . . . . above all, human.

This is the *good* Medical Director.

THERE is a *good* Medical Director for every *good* Medical Department. Often he is known as Chief of Medical Service, or General Medical Director, or Director of Employee Health, or, sometimes, as Plant Physician. He is almost ubiquitous among big industries, numerous in lesser situations, not usually found as yet in the really

small plant. There is now an insistent and widespread demand for more of him. The industries planning medical programs are ahead of the medical profession as a whole in recognizing that the era in which the mere possession of a medical degree was considered the sufficient qualification to practice *industrial* medicine has ended. Its ending came when the medical schools a few years ago started the teaching of industrial medicine. What the schools are now doing is described elsewhere in these pages.

IN HIS many-faceted capacity the Medical Director multiplies himself, in certain respects, through his staff—physicians, nurses, technicians, physiotherapists, secretaries, record clerks, assistants, nutritionists, and often dentists. These when the workers come to him.

Through industrial hygienists — engineers, chemists, technical experts in matters of environmental safety and security—and through his own plant visits, he goes to them.

In their general behalf he maintains liaison with other departments: employment, safety, casualty, legal, compensation, pension, insurance, industrial relations.

In their specific behalf he enlists the services of consultants—surgeons, psychiatrists, dermatologists, roentgenologists, experts in whatever capacity is needed—top men all; and uses the hospitals and other facilities of the community.

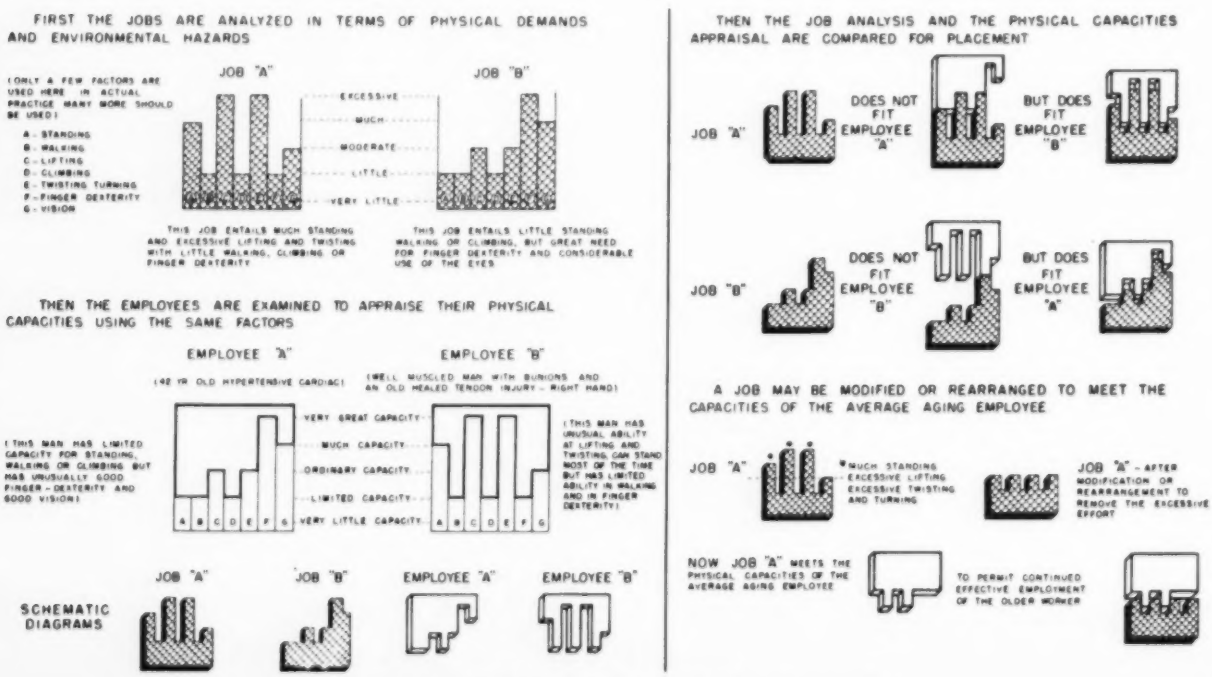
In his own behalf he maintains his interests in the educational and research institutions in the field, and in his professional organizations.

Many of the present-day Medical Directors are of the second generation. Upon them fell the mantles of the self-taught, courageous pioneers who established the principles and set the precedents which have been the rule and guide of much that is now a permanent part of industrial medicine. The younger men are worthy successors; the field and its future are safe in their hands.

THE number of Industrial Medical Services in the United States and Canada is increasing at a rapid, and accelerating, rate. Today's count, if it were available, would be less than the true one tomorrow. Without estimate as to the totality, there are numerous factual bases that prove it larger than is generally realized. One is the surveys made, and Approvals given, by the American College of Surgeons beginning with 1932 and continuing into 1950. The ACS Committee on Industrial Medicine and Traumatic Surgery formulated a Minimum Standard for Medical Service in Industry as follows:

1. The industrial establishment shall have an organized Medical Department or service with competent medical staff including consultants and also shall have adequate emergency, dispensary and hospital facilities and personnel to assure efficient care of the ill and injured.

2. Membership on the medical staff shall be restricted to physicians and surgeons who are (a) graduates from an acceptable medical school, with the degree of Doctor of Medicine, in good standing and licensed to practice in their respective states or provinces, (b) competent in the field of industrial


FIRST THE JOBS ARE ANALYZED IN TERMS OF PHYSICAL DEMANDS AND ENVIRONMENTAL HAZARDS
(ONLY A FEW FACTORS ARE USED HERE IN ACTUAL PRACTICE MANY MORE SHOULD BE USED)
A - STANDING
B - WALKING
C - LIFTING
D - CLIMBING
E - TWISTING TURNING
F - FINGER DEXTERITY
G - VISION
JOB "A"
JOB "B"
EXCESSIVE
MUCH
MODERATE
LITTLE
VERY LITTLE
THIS JOB ENTAILS MUCH STANDING AND EXCESSIVE LIFTING AND TWISTING WITH LITTLE WALKING, CLIMBING OR FINGER DEXTERITY
THIS JOB ENTAILS LITTLE STANDING WALKING OR CLIMBING, BUT GREAT NEED FOR FINGER DEXTERITY AND CONSIDERABLE USE OF THE EYES
THEN THE EMPLOYEES ARE EXAMINED TO APPRAISE THEIR PHYSICAL CAPACITIES USING THE SAME FACTORS
EMPLOYEE "A"
(42 YR OLD HYPERTENSIVE CARDIAC)
EMPLOYEE "B"
(WELL MUSCLED MAN WITH BUNIONS AND AN OLD HEALED TENDON INJURY - RIGHT HAND)
(THIS MAN HAS LIMITED CAPACITY FOR STANDING, WALKING OR CLIMBING BUT HAS UNUSUALLY GOOD FINGER - DEXTERITY AND GOOD VISION)
VERY GREAT CAPACITY
MUCH CAPACITY
ORDINARY CAPACITY
LIMITED CAPACITY
VERY LITTLE CAPACITY
A B C D E F G
(THIS MAN HAS UNUSUAL ABILITY AT LIFTING AND TWISTING CAN STAND MOST OF THE TIME BUT HAS LIMITED ABILITY IN WALKING AND IN FINGER DEXTERITY)
SCHEMATIC DIAGRAMS
JOB "A"
JOB "B"
EMPLOYEE "A"
EMPLOYEE "B"
THEN THE JOB ANALYSIS AND THE PHYSICAL CAPACITIES APPRAISAL ARE COMPARED FOR PLACEMENT
JOB "A"
DOES NOT FIT EMPLOYEE "A"
BUT DOES FIT EMPLOYEE "B"
JOB "B"
DOES NOT FIT EMPLOYEE "B"
BUT DOES FIT EMPLOYEE "A"
A JOB MAY BE MODIFIED OR REARRANGED TO MEET THE CAPACITIES OF THE AVERAGE AGING EMPLOYEE
JOB "A"
*MUCH STANDING
EXCESSIVE LIFTING
EXCESSIVE TWISTING
AND TURNING
JOB "A" - AFTER MODIFICATION OR REARRANGEMENT TO REMOVE THE EXCESSIVE EFFORT
NOW JOB "A" MEETS THE PHYSICAL CAPACITIES OF THE AVERAGE AGING EMPLOYEE
TO PERMIT CONTINUED EFFECTIVE EMPLOYMENT OF THE OLDER WORKER

"....To help fit him to his job, and his job to him...."

medicine and traumatic surgery, (c) worthy in character and in matters of professional ethics.

3. There shall be a system of accurate and complete records filed in an accessible manner, such records to include particularly a report of injury or illness, description of physical findings, treatment, estimated period of disability, end results, as well as other information pertinent to the case or required by statute for workmen's compensation claims or other purposes. All medical records shall be regarded as confidential material, filed under medical supervision, and kept in the medical department.

4. Patients requiring hospitalization shall be sent to institutions approved by the American College of Surgeons.

5. The Medical Department or service shall have general supervision over the sanitation of the plant and the health of all employees.

The application of the ACS Minimum Standard to the smaller plant required:

1. A definitely organized plan for the medical service.

2. A definitely designated staff of qualified physicians, surgeons, and attendants—with one physician in charge of the service.

3. Adequate emergency, dispensary, and hospital facilities.

4. Preplacement and periodic physical examinations—to be made only by qualified medical examiners.

5. Efficient care of all industrial injuries and occupational diseases.

6. Reasonable first aid and advice for employees suffering from non-industrial injuries and illnesses while on duty. For further professional care such employees to be referred to their own private or family physicians.

7. Education of the employee in accident prevention and personal hygiene.

8. Elimination or control of all health hazards.

9. Adequate medical records, including physical examination records, accessibly filed in the Medical Department under responsible medical supervision. Statistical summaries and analyses of the injury and illness experience to be made periodically.

10. Supervision of plant sanitation and all health measures for employees by the physician or surgeon in charge.

11. An ethical and cooperative relationship with the family physician.

12. The use of hospitals approved by the American College of Surgeons.

AT THE time, in 1950, when the College gave over this activity to the IMA, it had surveyed a total of *2293* industrial medical services and on the basis of compliance with the foregoing Standard, it was still possible to award to *1459* of them the American College of Surgeons' Certificate of Approval.

HERE the picture of the Medical Director, always real, becomes less abstract, more personal. The transition is aided by the fact that the American College of Surgeons, *in at least 1459 instances*, prior to July 1, 1950, had identified him as "Doctor of Medicine, in good standing, competent in the field of industrial medicine and traumatic surgery, worthy in character and in matters of professional ethics."

American College of Surgeons

Industrial Medical Department Surveys

ACS Certificates of Approval

1932–1950

Year	Total Surveys	Total Approvals
1932	174	74
1933	375	127
1934	975	518
1935	1122	622
1936	1314	712
1937	1657	843
1938	1710	880
1939	1782	933
1940	1854	959
1941	1840	959
1942	1840	1053
1943	1849	1101
1944	1900	1137
1945	1918	1137
1946	2001	1213
1947	2057	1248
1948	2137	1367
1949	2181	1359
1950	2293	1459

Organizations—

The Industrial Medical Association

THE Industrial Medical Association, organized in Illinois in 1915, had its first Annual Meeting at Detroit June 9, 1916. There were about 125 industrial physicians and surgeons in attendance, many of them Medical Directors, many more of them Chief Surgeons. In their field of industrial practice, they were self-educated. All were pioneers.

Industrial medicine in the United States had begun long before. It had its roots in the surgery of trauma. The first Plant Surgeon of record was Dr. William J. Middleton, at Pennsylvania Steel, in 1884. He was succeeded by Dr. John F. Culp in 1888. Dr. W. B. Lowman became Chief Surgeon for Cambria Iron, at Johnstown, in 1866. Dr. Robert T. Legge was made Chief Surgeon for McCloud River Lumber Company, in California, in 1899. In 1903, Dr. A. W. Colcord, whose industrial medical affiliations had begun in 1893 with U.S. Leather Company, was appointed Medical Director and Chief Plant Surgeon at the Clairton plant of Carnegie Steel Company; Cambria Steel opened the first and oldest industrial hospital at Johnstown, and Lackawanna Steel completed a 30-bed hospital at Lackawanna. Dr. T. R. Crowder was named Chief Surgeon for the Pullman Company, at Chicago, in 1905. Bethlehem Steel established a hospital at its San Francisco shipyards in 1907. Dr. William O'Neill Sherman was named Chief Surgeon for Carnegie Steel in 1909. Dr. E. R. Whipple followed Dr. Culp at Pennsylvania Steel in 1911.

In those days the emphasis was on surgery. This was changed and broadened as the principles of industrial medicine became clearer: *medical and surgical care* following industrial injury or disease; *prevention* by control of the work environment. Application of these principles was largely a matter of adapting and elaborating. But even at that time there were numerous instances where they had been carried to a high power of usefulness. The pioneers had the characteristics of mind and heart that enabled them to grasp, and forthwith to exemplify, the philosophy of industrial medicine. For them this philosophy had only one meaning: "First duty to the employee." That is its meaning today.

By 1914 there were enough Medical Directors and Chief Surgeons definitely established in their respective Medical Departments so that the first move to organize them was undertaken. This resulted in the Conference Board of Physicians in Industrial Practice, described elsewhere in these pages. New York and New England were its locale, although there were several members from Illinois.

GEORGE E. WILKINS, M.D.
President
Medical Director, New England Telephone and Telegraph Co.

ROBERT COLLIER PAGE, M.D.
President-Elect
General Medical Director, Standard Oil Company (N.J.).

KIEFER DAVIS, M.D.
First Vice-President
Medical Director, Phillips Petroleum Company.

E. S. JONES, M.D.
Second Vice-President
Medical Director, La Salle Steel Co.

ARTHUR K. PETERSON, M.D.
Secretary
Medical Director, R.R. Donnelley & Sons Company.

E. C. HOLMBLAD, M.D.
Treasurer and Managing Director, 28 E. Jackson, Chicago 4

INDUSTRIAL MEDICAL ASSOCIATION
Officers, 1953-54.

MEANWHILE, in Chicago, Andrew Harvey, who had been Medical Director of Crane Co. since June 1, 1896, had become interested in safety as well as in medicine and surgery. In late 1914, at the request of John M. Glenn, Secretary of the Illinois Manufacturers' Association, he arranged a medical and safety meeting at the City Club. Member companies were urged to send their physicians. After hearing Dr. Harry Mock on the importance of surgical first aid, the physicians were asked to consider the organization of a national society of industrial physicians. The proposal was given their approval, and Dr. Harvey appointed Dr. Mock (Sears Roebuck), J. C. Stubbs (National Malleable Castings), J. W. Lipman (Swift & Company), and J. D. Farnum (Avery & Company, Peoria) "to sound out" the attitude of industrial physicians and surgeons throughout the country. "There weren't many of them; no more than a few score were engaged full-time, and, for most, their situations had evolved from circumstances rather than choice. But they were strong men, thorough individualists. Their every move took courage; always inside the plant there was the challenge, the 'show me,' of both management and employees; outside, the criticism—industrial medicine was 'a field of anathema.' Professionally, they were lonely men. The move to bring them together met quick response." The unanimous approval expressed in their replies led to the incorporation (not-for-profit) in Illinois, in 1915, of the American Association of Industrial Physicians and Surgeons, and the decision to hold the first Annual Meeting in Detroit the following year at the time of the Annual Meeting of the American Medical Association. The incorporators were Drs. A. M. Harvey, H. E. Mock, C. G. Farnum, J. C. Stubbs, W. E. Post, and T. R. Crowder, of Chicago; and S. M. McCurdy, of Cleveland.

In 1951, the Association name was changed to Industrial Medical Association.

NOW in its thirty-eighth year, the Industrial Medical Association has held five Annual Meetings in Detroit; five in Chicago; four in Atlantic City; three in Philadelphia; two in Boston; two in Buffalo; two in Cincinnati; two in New York City; two in Cleveland, and one each in Milwaukee, Baltimore, Minneapolis, Pittsburgh, St. Louis, Rochester, and Los Angeles.

EACH year the Industrial Medical Association makes two Awards, both of which have become of national importance. One, the Knudsen Award, established by William S. Knudsen in 1939 when he was president of General Motors Corporation, is given to a member of the medical profession who has become distinguished in industrial medical practice. The other is given to management. It is the Award for Health Achievement in Industry, and it recognizes the inauguration and improvement *by management* of a comprehensive Medical Department for its employees.

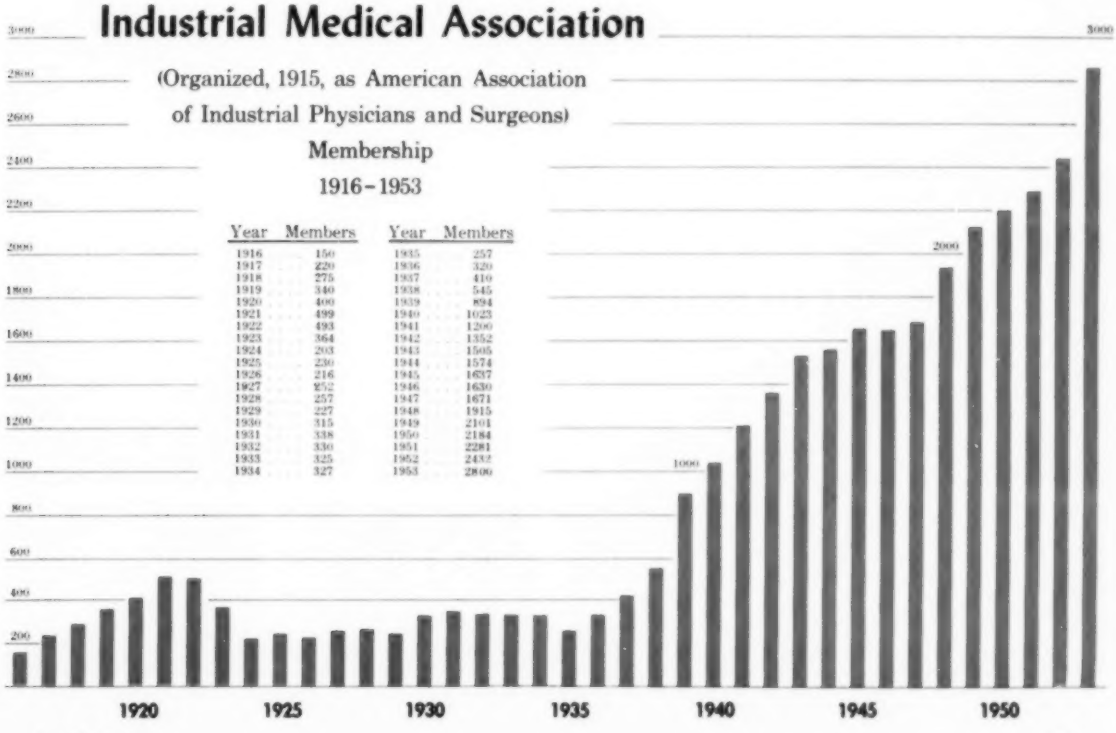
Industrial Medical Association

(Organized, 1915, as American Association of Industrial Physicians and Surgeons)

Membership

1916–1953

Year	Members	Year	Members
1916	150	1935	257
1917	220	1936	320
1918	275	1937	410
1919	340	1938	545
1920	400	1939	894
1921	499	1940	1023
1922	493	1941	1206
1923	364	1942	1352
1924	203	1943	1505
1925	230	1944	1574
1926	216	1945	1637
1927	252	1946	1630
1928	257	1947	1671
1929	227	1948	1915
1930	315	1949	2101
1931	338	1950	2184
1932	330	1951	2281
1933	325	1952	2432
1934	327	1953	2800



Knudsen Award Recipients

Above (left to right):

Leroy U. Gardner, M.D.	1940
Clarence D. Selby, M.D.	1942
Royd R. Sayers, M.D.	1941
C. O. Sappington, M.D., Dr. P.H.	1939

Below (counter-clockwise):

William A. Sawyer, M.D.	1943
Harold A. Vonachen, M.D.	1944
Anthony J. Lanza, M.D.	1946
Carey P. McCord, M.D.	1947
T. Lyle Hazlett, M.D.	1948
Robert A. Kehoe, M.D.	1949
Edward C. Holmblad, M.D.	1950
Robert T. Legge, M.D.	1951
Max R. Burnell, M.D.	1952
Alice Hamilton, M.D.	1953

The Knudsen Award

HAPPILY in this land, and this includes the Industrial Medical Association as a part, there is no aristocracy, no royalty, no peerage. There is just one exception—the aristocracy of achievement, of leadership, of devotion. This is true of all organizations of men and women of good will and high purposes. All too often it comes about that deserving aristocracy lives out its life unsung and unmarked by any badge of looming honor. Not so in the Industrial Medical Association. Beginning in 1939, every year save one year, the Association has recognized and augmented its aristocracy by the bestowal of its coveted citation, the William S. Knudsen Award. This was named for, and perpetuates the memory of, General Knudsen, a giant in industrial leadership, an ardent supporter of industrial medicine at its best, and for years the provider of the bronze Award itself.

Careful and earnest are the deliberations of Association committees charged with the selection of the recipient of this yearly Award. Its presentation is the "high tor" of the Annual Conference. The roster of the Knudsen Award recipients in itself reflects the Association's leadership over its later years. Theirs are brilliant pages in the history of industrial medicine.

Their citations follow:

1939, Cleveland:

DR. CLARENCE O. SAPPINGTON—For distinction as a consultant in the fields embraced in his book of the year: "Medicolegal Phases of Occupational Diseases."

1940, New York:

DR. LEROY U. GARDNER—For his investigations of silicosis, and his research on other dusty lung diseases.

1941, Pittsburgh:

DR. ROYD R. SAYERS—For any of many contributions made, but specifically emphasizing studies in absenteeism.

1942, Cincinnati:

DR. CLARENCE D. SELBY—For leadership in the progress of industrial medicine, but at that time for notable contributions related to industrial medicine in national defense.

1943, Rochester:

DR. WILLIAM A. SAWYER—For outstanding contributions to programs of nutrition in industry, programs for rehabilitation, and studies of the aging process in industrial workers.

1944, St. Louis:

DR. HAROLD A. VONACHEN—For notable studies on human relations in industry.

1946, Chicago:

DR. ANTHONY J. LANZA—For leadership in the development of industrial medicine in the United States and the world.

1947, Buffalo:

DR. CAREY P. MCCORD—For a public relations book designed for the laity, "A Blind Hog's Acorns."

1948, Boston:

DR. T. LYLE HAZLETT—For celebrated endeavors in the promotion of formal education in industrial medicine.

1949, Detroit:

DR. ROBERT A. KEHOE—For distinguished work in laboratory and clinical investigations of lead intoxication.

1950, Chicago:

DR. EDWARD C. HOLMBLAD—For praiseworthy advancements in the organization of industrial medicine on a national and international basis.

1951, Atlantic City:

DR. ROBERT T. LEGGE—For being industrial medicine's renowned statesman, historian, and ambassador.

1952, Cincinnati:

DR. MAX BURNELL—For leadership and services in the promotion of better formal education in industrial medicine.

1953, Los Angeles:

DR. ALICE HAMILTON—For early and continuing leadership in industrial health through field investigations, book publications, governmental enterprises, and in the realm of education.

The Health Achievement Award

THE AWARD for Health Achievement in Industry—given in recognition of the inauguration and improvement *by the management of a company* of a comprehensive Medical Service for its employees—was established by the Industrial Medical Association in 1949.

The recipients have been:

1949—Rome Cable Corporation, Rome, New York.

1950—Bradley Mining Company, Stibnite, Idaho.

1951—C. T. Dearing Printing Company, Louisville, Kentucky.

1952—East Liverpool District Potteries, East Liverpool, Ohio.

1953—Imperial Oil, Limited, Toronto, Ontario, Canada.

THE significance of this Award is that it is given *to the Company* for and because of its Medical Department, rather than to the Department itself.

It recognizes, however, that in the Medical Department there is a physician "with the time, the purpose and the opportunity to exercise, *in the friendly atmosphere of executive inspiration and whole-hearted management support*, the patience, interest, professional competence, and im-

agination that are needed" in the pursuit of the almost limitless opportunities in *preventive* medicine—"so that he may find the diabetes, the failing heart, the carcinoma, the gastric ulcer, the tuberculosis, and whatever else is developing, *in time to minimize the consequences.*"

The recipient of this Award is selected each year by a committee of the Industrial Medical Association appointed for that purpose. The selection itself has become a matter of considerable importance, as the number of companies that qualify for the Award increases each year. In 1949, Rome Cable Corporation was chosen from among four Medical Departments that were visited by Committee members; in 1953 more than a dozen companies were on the list from which Imperial Oil, Limited, was chosen. In the light of current developments, the Committee may find twice as many in 1954 from which to select, and the Industrial Medical Association may have to consider the propriety of making more than one Award.

Rome Cable Corporation

THIS company is an independent manufacturer of electrical wires and cables. It has its own rod rolling mills. Its products cover the broad field of electrical applications in high and low voltage service, ranging from the transmission of heavy power loads to the intricate and highly specialized transmission of radio and electronic circuits.

Rome Cable Corporation's Medical Department has been described in detail in this Journal (18:5, 79 (May) 1949). The article about it was headed "A Preventive Medical Service for 1100 Employees." At the end of 1952, this number had grown to 1600. Meanwhile, the total number of visits to the Medical Department had increased from 8,486 in 1949, to 26,544 in 1952.

This Award recognized Herbert T. Dyett as Chairman of the Board, and James H. McDonough, M.D., as Medical Director. The presentation, on April 7, 1949, was made to A. D. Ross Fraser, President of the corporation. Dr. McDonough is a graduate of Washington and Jefferson College and the University of Pennsylvania School of Medicine, where he received his M.D. in 1942. In 1946, he qualified for a Fellowship in Industrial Medicine and Surgery at the University of Pittsburgh Medical School. Graduating there, he was appointed Medical Director at Rome Cable in February, 1948; and his Medical Department, new in physical appointments and complete in the scope of its service, opened its doors officially in May, 1948.

Rome Cable Corporation has a distinguished and enviable record in the humanities of industrial operation.

Bradley Mining Company

STIBNITE, Idaho, is a typical mining town, built around the Yellow Pine Mine of Bradley Mining Company, deep in the mountains, isolated, and difficult of access. The residents are practically all employees of the mining company or their dependents. The mining operations are mechanized, and about 250 people are employed. Under these circumstances, the Medical Department was designed to serve the entire community. The company constructed and equipped the Stibnite Hospital and Clinic at a cost of about $150,000; and the company pays all bills incident to the operation of the hospital and clinic, including upkeep of the plant, supplies, medicines and drugs, and salaries and wages of all hospital and clinic employees and staff members. Administration of the policies, services, and regulations governing the hospital and clinic (and all medical service in the community) is vested in a Hospital Board consisting of the Company Physician, the head nurse, three representatives of management, and two employee representatives elected by the employees.

"Medical care for the employees of the company, at Stibnite, Idaho, is on a fee basis, and is conducted in every way like a private practice. There is no compulsion to use the facilities provided by the company.

"A modern hospital, with six completely furnished private rooms and two five-bed wards, is maintained for the employees and their families. It has a completely equipped modern surgery and x-ray department. The hospital staff consists of the Company Physician, registered nurse, nurses' aides, and what other help is needed.

"All medical treatment, surgery, and hospitalization of employees resulting from occupational disease or injuries arising out of and in the course of employment, are provided at no cost to the employee. For non-industrial cases—employees and their wives and children under 18 years of age, and *bona fide* dependents—treatment is also available under the following plan: Consultation, office calls, examination, treatment, and hospitalization are rendered by the Company

Physician at a charge equivalent to one-half the average standard charge made by the doctors and hospitals of Boise, Idaho, and other neighboring communities. For all medicines dispensed from the Stibnite Hospital the charge is the actual cost to the Bradley Mining Company, plus a small handling charge. When necessary to call in a doctor from the outside, the cost of the services is paid half by the company and half by the patient.

"There is also a Voluntary Contribution and Benefit Plan for employees and dependents which costs the employee $1.50 a month, $2.00 a month for his wife, and 50 cents a month for each child. This plan pays half the hospital or medical bill, if it is more than $20.00 for an employee and $50.00 for wife or child, before the company subsidy of 50% is paid. This amounts to the cost of medical care for non-industrial cases and dependents being only one-fourth of the usual cost. Every employee is entitled to, and encouraged to have, an annual physical examination, including a chest x-ray and the necessary laboratory work. Wives, and children under 18, are also entitled to this examination."

Fawcett-Dearing Printing Company

THE Health Achievement Award in 1951 was given to C. T. Dearing Printing Company of Louisville, Kentucky—now the Fawcett-Dearing Printing Company. The following comment is subordinated in this text to the fact of the Award. This Medical Department is to be described in a future issue of this Journal.

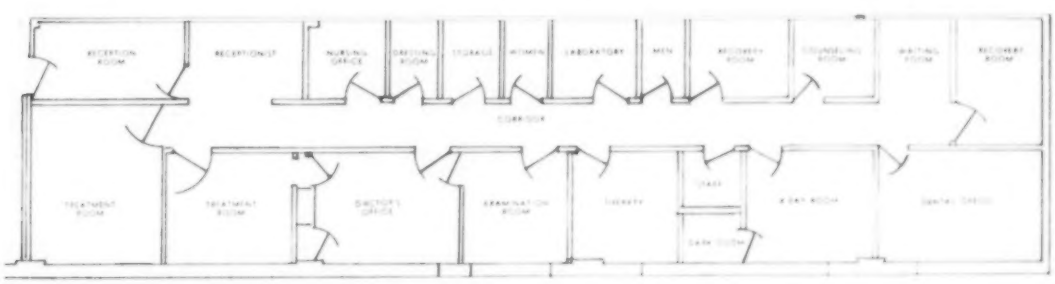
This company, founded in Louisville in 1865, is now a division of Fawcett Publications, New York. It is engaged in the manufacture of magazines, and it turns out *more than 30 million a month*. Its 1500 workers are represented by eight AFL unions. The company name was changed in 1952. The plant has a national as well as a local reputation for the excellence of its employee relations policies and activities. The company's welfare program includes pension plan insurance, group insurance, and accident and health insurance, in addition to the special attention paid the individual employee during times of illness, stress or strain. There is also a complete recreation program with a full-time supervisor, operated by and for the employees.

The modern, 16-room, centrally located Medical Department was completed, with facilities and personnel, and ready for service early in 1948. The Department is air-conditioned and soundproofed. So that each employee, whether receiving treatment, or having a conference or a physical examination, may enjoy complete privacy, all rooms are arranged so that they may be closed off from the corridor or adjoining rooms.

Dr. Gradie R. Rowntree, of Louisville, was selected to become the Medical Director long before the Department was ready for service. Dr. Rowntree began planning for this health service while still engaged in the study of industrial medicine at Columbia University. His staff now consists of a full-time physician, a part-time physician, a dentist, four registered nurses, a laboratory technician, a counselor, and a secretary. Consultant service—on surgery, medicine, otolaryngology, dermatology, cardiology, and allergy—is used as needed.

The scope of the health services is preventive as well as curative. The preventive aspects are given major emphasis. The physical examination, a part of the preventive phase, includes a complete history, and physical and laboratory tests. A blood count, Kahn test, urinalysis, and a 14 x 17 inch chest x-ray is made on each person examined. All those over 40 have an electrocardiograph. A basal metabolism test is given when indicated. The preplacement physical examination is made for the purpose of fitting the prospective employee to a suitable job, and ascertaining his general health status. The promotional physical examination is done to determine, with the individual, his physical fitness for the proposed change in job status. The periodic physical examination is offered all employees for the purpose of promoting their health.

The assurance of a safe and healthful work environment is another of the preventive activities of the Medical Director. He meets regularly with a committee of members from all departments of the plant, and plans continuously with them and the safety engineers regarding the environment.



Health education is provided through informal discussions, planned interviews, movies, slides, pamphlets, and a regularly featured article in the employees' monthly magazine. Two courses in nutrition have been offered for the wives of employees. These consist of six weekly discussions on various subjects, such as how to pack nutritious lunches, food selection, and low-cost menus. Counseling on family health problems is included in the employees' health service. Frequently an employee will not know where or how to seek a specialized medical service needed by a member of his family. Finding the answer often means for him freedom from worry.

Case-finding and follow-up services receive special care.

The curative phase of the health service includes emergency treatment for injuries and illnesses occurring on the job.

The company recognizes that through its health service it is making a contribution to the health of the community as well as to that of its own employees. It participates in the local blood donor service, and cooperates with the local board of health, the local professional associations, the Veterans Administration vocational rehabilitation, the local nutrition committee, and other community agencies.

The program has been well received by the employees. They have not only accepted the service well, but are also using it freely and confidently. Increasingly, they are arriving at the level where they are assuming a greater responsibility for the health needs of themselves and their families. Since the inception of the health service there has been a sharp drop in all accidents, especially in the number of lost-time accidents. Absenteeism has decreased sharply. There is less preventable illness. Production has increased. The number of visits to the Medical Department for all causes has grown from 8,622 in 1948, to 20,659 in 1952. The plant population is practically the same for all these years.

East Liverpool District Potteries

THE Health Achievement Award in 1952 recognized a cooperative Medical Service set up by six companies engaged, and competing, in the same kind of business. The smallest has about 300 workers; one has about 500; three have 1,000; one has about 3,000. All six companies are located within a four-mile radius along the Ohio River. Some are in Ohio; some in West Virginia. The program was developed in 1944; priorly no medical service had existed. Interest in silicosis was the motivation, although other health matters were considered equally important. Five of the six companies make dinnerware pottery; one, hotel and restaurant pottery. The industry is classed as having light accident-severity. Practically all the workers are residents of the district; the majority are of English or Scotch extraction. The sex ratio is about 60% male; 40% female. Highly skilled occupations predominate; the skilled trades have been "handed down" through generations.

The medical program is under the direction of Dr. Joseph T. Noe, full-time Medical Director. There are seven full-time registered industrial nurses; five plants have one, the largest two. All plants have a complete dispensary—the largest has two; and all dispensaries except one are equipped with x-ray machines. The nurses are trained as x-ray technicians. The dispensaries render first aid and simple medical care for minor illnesses, and handle emergency medical and traumatic cases. Definitive and operative therapy is given at the local city hospital.

The Medical Director divides his time between the six plants, and is paid on a percentage basis determined by the employment rate. He maintains a central office adjoining the dispensary in the largest plant—this for purposes of group statistics, library, research studies, correspondence, and other activities relating to the group as a whole. Each company Medical Department is a separate autonomous unit, with its own records, reports, statistics, etc. In general, the policy and procedures of all six company programs are similar. There are some variations, to suit particular needs. A close understanding and cooperation exist between the personnel of the industrial program, the local private practitioners, and the county medical societies.

The medical program is strictly voluntary. Employees who do not wish to take advantage of the service are not coerced in any way. Few decline the offer. For practically the same plant population, the number of Medical Department visits has increased from 34,824 in 1949, to 43,159 in 1952.

The major functions of this Medical Department are: (a) Physical examinations—pre-employment, periodic, absentee, and change of occupation. (b) Laboratory studies—x-ray, urinalysis, blood Wassermanns. (c) Counseling—compensation, health (general), insurance, occupational injury and disease, retirement, job change. (d) First aid. (e) Relief of symptoms for minor ailments. (f) Diagnostic service. (g) Emergency service for serious injuries and illnesses. (h) Safety. (i) Health education. (j) Control of communicable disease. (k) Rehabilitation. (l) Record system, individual and group. (m) Sanitation—plant housekeeping, washing and toilet facilities, food handlers' examination and inspection. (n) Industrial hygiene. (o) Veneral disease. (p) Silicosis research.

This cooperative program has many interesting features, which are to be described in detail in an early issue of this Journal.

Imperial Oil, Limited

THE Health Achievement Award in 1953 was given to Imperial Oil, Limited, of Toronto, Canada. Dr. R. G. Birrell joined Imperial Oil in late 1947, and the Medical Department had its inception with his appointment. Within the past five years, his Medical Department has grown from one part-time physician, to a total of 54 professional personnel, 22 registered nurses, two technicians, and 29 physicians, of whom seven are full-time. With one office in Toronto, the Medical Health Centers are located in 13 units, scattered as far as the Northwest Territory settlement of Norman Wells, and extending from Vancouver on the Pacific to Halifax on the Atlantic. The employee population falls between 13,000 and 14,000, varying from 2700 at the Sarnia refinery to 70 at Norman Wells.

The Medical Department reaches the widely scattered plants of the company through two types of units, Medical Centers and Health Centers.

Medical Centers are found in plants with the larger populations, such as Edmonton, Sarnia, Toronto, and Montreal. These are under the direction of a full-time physician, and are staffed by full-time nurses and technicians, with additional part-time medical help as needed. About 6000 employees are so served.

Health Centers are found where the plant population falls between 250 and 600, and are staffed by a full-time nurse under the direction of a part-time physician. This physician has regular hours in the in-plant Health Center, and spends two to three half days on the job. About 4000 employees are served by these centers.

The physician assigned full-time to the Medical Center frequently visits the Toronto office for conferences and consultation. The Toronto office sends medical and nursing personnel on periodic field trips to all Centers. Monthly reports are received from all units by the Medical Director.

Medical policy emphasizes preplacement and periodic examinations, health and medical counseling, the maintenance of confidential medical records, and close cooperation with the practicing physicians in the community. Preplacement examinations have risen from 354 in 1947 to an annual average of 3000. Periodic examinations in the same period rose from 154 to more than 4000 in 1952.

The Medical Director reports to a designated member of the Board of the company. The close support and understanding cooperation of management with the objectives of the industrial health and medical program are evident from the growth and effective use of the medical facilities by the plant population. In-plant Medical Center and Health Center visits have risen from 31,000 in 1949 to more than 72,000 in 1952. The number of employees has increased only about 10% since 1949.

The nursing staff has been chosen from those who hold an R.N. degree and have additional health nursing experience, such as is gained in the Victorian Order of Nursing (Home Nursing) or in public health nursing.

This Medical Department is scheduled to be fully described at a near time in this Journal.

INDUSTRIAL MEDICAL ASSOCIATION

HAS · APPROVED · THE · MEDICAL · SERVICE · OF

The Medical Department of the . . . . . .

WHICH · HAS · COMPLIED · WITH · THE · STANDARD · FOR · MEDICAL · SERVICE IN · INDUSTRY · OF · THE · INDUSTRIAL · MEDICAL · ASSOCIATION AND · THE · AMERICAN · FOUNDATION · OF · OCCUPATIONAL · HEALTH

I

THIS industrial establishment has an organized medical department or service with competent medical staff, including consultants. It has policy, procedures and facilities for adequate emergency dispensary and hospital needs and personnel to assure efficient care of the ill and injured.

II

MEMBERSHIP on the medical staff is restricted to doctors and/or nurses who are (a) graduates of acceptable schools of learning with degrees of Doctor of Medicine and Registered Nurse respectively, in good standing and licensed to practice in their respective states or provinces, (b) competent in the field of medicine and nursing as applied to industry, (c) worthy in character and in matters of professional ethics.

III

FACILITIES are available for the performance of competent preplacement and voluntary periodic medical examinations in keeping with existing needs of the industrial organization.

IV

A system of accurate and complete records is maintained. Such records include, particularly, a report of injury or illness, description of physical findings, treatment, estimated period of disability, end results, as well as other information pertinent to the case or required by statute for Workmen's Compensation claims or other purposes. All medical records are regarded as confidential material, filed under medical supervision, and maintained only in the medical department.

V

EMPLOYEES requiring special care are referred to competent consultants.

VI

THE medical department or service has general supervision over the sanitation and industrial hygiene of the plant which has to do with the health and medical welfare of all employees.

This certificate is hereby granted

August 28, 1952

E. A. Irvin, M.D.
President, Industrial Medical Association

R. C. Page, M.D.
Trustee, American Foundation of Occupational Health

American Foundation of Occupational Health

ONE of Industrial Medical Association's most important activities is expressed through the American Foundation of Occupational Health. This is a tax-exempt educational trust, established by the IMA in 1945 "to improve the teaching of industrial medicine and occupational health in medical schools, and schools of public health, and to conduct studies and surveys of facilities and educational programs in medical fields as applied to industry, as well as to obtain funds for the sponsorship of medical residencies and postgraduate training in industrial medicine." By 1950 this program was so well accepted and appreciated that the officers of the Industrial Medical Association, and the Trustees of the American Foundation of Occupational Health, agreed to assume the evaluation and certification of medical services in industry which since 1932 had been conducted by the American College of Surgeons. This gave the Foundation added scope in its service to industry. Its activities now include studies and surveys of medical services in business and industry, and it provides both with a reliable source for consultation and recommendations concerning the quality and quantity of medical services required for employees.

The Foundation was fully described in the "Trustees' Report of the Present Status," published in this Journal (22:5, 191 (May) 1953). This report identified the Trustees and the members of their Advisory Board—"representatives of all recognized associations and top business executives from all forms of industry"—and set forth the requirements established for the Certification of industrial medical services. These requirements take thorough cognizance of the impact of the technological and social changes of the last two decades upon the work-life of the individual. "We are constantly reminded that a human being lives in equilibrium with his environment and that, in some degree, he affects, and is affected by, all the conditions that surround him. In industry the application of this concept begins with the preplacement examination which goes far beyond the former so-called 'pre-employment' examination. The new employee is considered from a total environment point of view, with the physical examination *per se* taking its rightful place in the medical analysis of the total individual. The next step is the performance of comprehensive periodic inventories at suitable intervals. These include the sociologic history of the individual, all emotional factors, his reaction to stress and strain, the character of his home life, and facts in relationship to his non-work activities; all of which, with the physical findings, give the examining physician all that is necessary for him to consider the employee from a total environment point of view."

THE IMA requirements for Certification, therefore, are modern. Moreover, they are so comprehensively based that they will remain modern. They provide a standard for employee medical service in any situation from a work force of as few as 50 to an operation of 25,000. This alone is evidence of their broadened scope. But they have another and equally important significance, which may be realized from the phrasing of the new Certificate (opposite page). The transition is from the "shall" of the minimum standard to the "has," "is," and "are" of the entity that embodies the standard—from the almost passive recognition of surgical adequacy, to the active present tense of medical and surgical completeness.

The comprehensiveness of the Foundation's program, the wisdom and experience concentrated in its development, and the vitality it is giving to the growth and effectiveness of industrial medical services in general bespeak the continued support of medicine and management.

The Foundation has given the Industrial Medical Associations' Certificate of Approval to 152 industrial medical services since May 1, 1951.

Approved Medical Services, American Foundation of Occupational Health

ABBOTT LABORATORIES, North Chicago.

ABBOTTS DAIRIES, Philadelphia.

ALLIED CHEMICAL & DYE CORPORATION, National Aniline Division, Buffalo.

ALLIS-CHALMERS MANUFACTURING COMPANY, Milwaukee, Wisconsin.

ALUMINUM ORE COMPANY, East St. Louis, Illinois.

AMERICAN BRAKE SHOE COMPANY, Chicago.

AMERICAN BRIDGE COMPANY, Gary Plant.

AMERICAN CAN COMPANY, GENERAL RESEARCH LABORATORY, Maywood, Illinois.

AMERICAN CYANAMID COMPANY, WARNERS PLANT, Linden, New Jersey.

AMERICAN CYANAMID COMPANY, CALCO CHEMICAL DIVISION, Round Brook, New Jersey.

AMERICAN OPTICAL COMPANY, Southbridge, Massachusetts.

AMERICAN SMELTING AND REFINING COMPANY, Denver, Colorado.

AMERICAN VISCOSE CORPORATION, Philadelphia.

ARMCO STEEL CORPORATION, Ashland, Kentucky.

AVONDALE MILLS, DRUMMOND FRASER HOSPITAL, Sylacauga, Alabama.

BAUSCH AND LOMB OPTICAL COMPANY, Rochester, New York.

BELL TELEPHONE COMPANY OF CANADA, Montreal, Canada.

BOHN ALUMINUM & BRASS CORPORATION, Detroit.

BOSTON EDISON COMPANY, Boston.

BURROUGHS WELLCOME & COMPANY, Tuckahoe, New York.

CARBIDE AND CARBON CHEMICAL COMPANY, a unit of UNION CARBIDE AND CARBON CORPORATION, Texas City, Texas.

CARBIDE AND CARBON CHEMICAL COMPANY, INSTITUTE PLANT, Charleston, West Virginia.

THE CARTER OIL COMPANY, Tulsa, Oklahoma.

Caspers Tin Plate Company, Chicago.

Cheney Brothers, Manchester, Connecticut.

Chicago Carton Company, Chicago.

Cockshutt Farm Equipment Limited, Brantford, Ontario, Canada.

Consolidated Edison Company of New York Incorporated, New York.

Curtis Publishing Company, Philadelphia.

Deere & Company, Moline, Illinois.

Dennison Manufacturing Company, Framington, Massachusetts.

Diamond T Motor Car Company, Kolmar Plant, Chicago.

Doehler-Jarvis Corporation, Batavia, New York.

Doehler-Jarvis Corporation, Chicago.

Jarvis Division of the Doehler-Jarvis Corporation, Grand Rapids, Michigan.

Doehler-Jarvis Corporation, Pottstown, Pennsylvania.

Doehler-Jarvis Corporation, Executive Division, Toledo, Ohio.

Doehler-Jarvis Corporation, Medical Installation of Toledo Plants, Toledo.

R. R. Donnelley and Sons Company, Chicago.

E. I. du Pont de Nemours & Company, Incorporated, Arlington Works, Arlington, New Jersey.

E. I. du Pont de Nemours & Company, Incorporated, Augusta, Georgia.

E. I. du Pont de Nemours & Company, Fort Madison, Iowa.

E. I. du Pont de Nemours & Company, Grasselli, New Jersey.

E. I. du Pont de Nemours & Company, Louisville, Kentucky.

E. I. du Pont de Nemours & Company, Newburgh, New York.

E. I. du Pont de Nemours & Company, Film Department, Old Hickory, Tennessee.

E. I. du Pont de Nemours & Company, Philadelphia.

E. I. du Pont de Nemours & Company, Photo Products Department, Towanda, Pennsylvania.

E. I. du Pont de Nemours & Company, Waynesboro, Virginia.

E. I. du Pont de Nemours & Company, Wilmington, Delaware.

E. I. du Pont de Nemours & Company, Louviers Building, Wilmington, Delaware.

East Liverpool District Potteries, in and around East Liverpool, Ohio.

Eastman Kodak Company, Rochester, New York.

Ecusta Paper Corporation, Subsidiary of Olin Industries Incorporated, Pisgah Forest, North Carolina.

Electrometallurgical Company, Union Carbide and Carbon Corporation, Niagara Falls, New York.

Esso Standard Oil Company, Baton Rouge Refinery, Baton Rouge, Louisiana.

Esso Standard Oil Company, Bayway Refinery, Linden, New Jersey.

Esso Standard Oil Company, New York.

Ethyl Corporation, Baton Rouge.

Firestone Tire and Rubber Company, Akron, Ohio.

Ford Motor Company, Engineering Laboratory, Dearborn, Michigan.

Ford Instrument Company, Division of the Sperry Corporation, Long Island City, New York.

General Electric Company, Bucyrus Glass and Lamp Works, Bucyrus, Ohio.

General Electric Company, Lamp Division, Cleveland, Ohio.

General Electric Company, Lamp Works, Newark, New Jersey.

General Electric Company, Nucleonics Division, Richard, Washington.

General Electric Company, Trumbull Lamp Works, Warren, Ohio.

General Mills Incorporated, South Minneapolis, Minnesota.

Fisher Body Division, General Motors Corporation, Lansing, Michigan.

Frigidaire Division, General Motors Corporation, Dayton, Ohio.

Gilbert & Barker Manufacturing Company, West Springfield, Massachusetts.

B. F. Goodrich Company, Akron, Ohio.

B. F. Goodrich Company, Institute Plant, Charleston, West Virginia.

Goodyear Tire & Rubber Company, Akron, Ohio.

Hercules Powder Company, Kenvil, New Jersey.

Hood Rubber Company, Watertown, Massachusetts.

George A. Hormel & Company, Austin, Minnesota.

Illinois Bell Telephone Company, Chicago.

Imperial Oil Limited, Toronto, Canada.

International Harvester Company, Chicago.

International Harvester Company, Indianapolis, Indiana.

International Ladies Garment Workers' Union, Union Health Center, New York.

Johnson and Johnson, and Subsidiaries, New Brunswick, New Jersey.

Kelsey Hayes Wheel Company, Jackson, Michigan.

Lederle Laboratories, Division American Cyanamid Company, Pearl River, New York.

Lever Brothers Company, Lever House, New York.

Eli Lilly and Company, Indianapolis.

Lockheed Aircraft Corporation, Burbank, California.

The McKinnon Industries Limited, St. Catharines, Ontario, Canada.

Metropolitan Life Insurance Company, New York.

Monsanto Chemical Company, Plastics Division, Springfield, Massachusetts.

Monsanto Chemical Company, St. Louis, Missouri.

Miles Laboratories Incorporated, Elkhart, Indiana.

John Morrell & Company, Ottumwa, Iowa.

National Biscuit Company, Niagara Falls, New York.

National Supply Company, Engine Division, Springfield, Ohio.

National Supply Company, Toledo.

New England Telephone & Telegraph Company, Boston.

New Jersey Bell Telephone Company, Newark, New Jersey.

New York Hotels Trades Council and Hotel Association Health Center Incorporated, New York.

New York Times, New York.

Nordberg Manufacturing Company, Milwaukee, Wisconsin.

North American Aviation Incorporated, Port Columbus, Ohio.

North American Cyanamid Limited, Niagara Falls, Ontario, Canada.

Norton Company, Worcester, Massachusetts.

Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Oneida Limited, Oneida, New York.

Olin Industries Incorporated, East Alton, Illinois.

Otis Elevator Company, Limited, Hamilton, Ontario, Canada.

Owens-Illinois Glass Company, Kaylo Division, Berlin, New Jersey.

Owens-Illinois Glass Company, Clarion Plant, Clarion, Pennsylvania.

Owens-Illinois Glass Company, Fairmont, West Virginia.

Kimble Glass Company, Subsidiary of Owens-Illinois Glass Company, Gas City, Indiana.

Owens-Illinois Glass Company, Glassboro, New Jersey.

Owens-Illinois Glass Company, Glass Container Division, Huntington, West Virginia.

Kimble Glass Company, Subsidiary of Owens-Illinois Glass Company, Muncie, Indiana.

Owens-Illinois Glass Company, Duraglas Center, Toledo, Ohio.

Kimble Glass Company, Subsidiary of Owens-Illinois Glass Company, Toledo.

Owens-Illinois Glass Company, General Offices, Ohio Building, Toledo, Ohio.

Owens-Illinois Glass Company, St. Charles, Illinois.

Kimble Glass Company, Subsidiary of Owens-Illinois Glass Company, Vineland, New Jersey.

Pacific Telephone & Telegraph Company, Southern California Area, Los Angeles, California.

Charles Pfizer & Company Incorporated, Brooklyn, New York.

Philadelphia Gas Works Company, Philadelphia.

Phillips Petroleum Company, Kansas City, Kansas.

Remington Arms Company Incorporated, Bridgeport, Connecticut.

Procter & Gamble Company, Cincinnati.

Republic Steel Corporation, South Chicago, Illinois.

Republic Steel Corporation, Main Medical Department, Youngstown, Ohio.

Republic Steel Corporation, Open Hearth Plant, Youngstown, Ohio.

Seeger Refrigerator Company, Evansville, Indiana.

Socony-Vacuum Oil Company, Detroit.

Standard Oil Development Company, Linden, New Jersey.

Standard Oil Company (N.J.), New York.

Standard Vacuum Oil Company, New York.

Sylvania Electric Products Incorporated, Bayside, New York.

Tennessee Eastman Company, Kingsport, Tennessee.

Travelers Insurance Company, Hartford, Connecticut.

Union Carbide and Carbon Corporation, Executive Offices, New York.

United Aircraft Corporation, East Hartford, Connecticut.

United States Steel Company, South Works, Chicago.

United States Steel Company, Gary Sheet Tin Mills, Gary, Indiana.

United States Steel Company, Gary Works, Gary, Indiana.

National Tube Company (United States Steel Company), Gary, Indiana.

Upjohn Company, Kalamazoo, Michigan.

Western Electric Company Incorporated, Chicago.

Westinghouse Electric Corporation, East Pittsburgh, Pennsylvania.

Contrasts

THEN: Dr. Alvin W. Schoenleber, former Medical Director, Standard Oil Company (New Jersey), in the first chapter of his book, "Doctors in Oil," a story of medical pioneers in oil fields around the world, says, "The Standard Oil Company offices were then (circa 1918) at 26 Broadway in New York City. . . . The Medical Director's office was only a small cubbyhole, barely wide enough to hold a desk and chair. The first-aid room was even smaller. It was dark, dingy, and contained practically no equipment. The entire headquarters personnel consisted of the Medical Director and his secretary, who had a small desk in the clerical section of another department. . . . The medical staff then consisted of the Medical Director and three plant doctors located at nearby refineries."

NOW: The following reflects the Medical Department of Standard Oil Company (New Jersey) as of today:

COUNTRY	TOTAL MEDICAL DEPARTMENT EMPLOYEES	TOTAL COMPANY EMPLOYEES
Italy	41	4695
Canada	51	13661
Indonesia	211	54776
France	17	6469
England	30	12342
Egypt	1	349
Germany	3	4562
Norway	1	475
Sweden	1	980
Denmark	2	550
Belgium	1	250
Switzerland	1	375
Holland	2	300
Finland	3	775
Austria	1	325
United States	199	36502
Aruba	197	7322
Venezuela	509	14600
Colombia	123	4100
Peru	192	4469
Argentina	102	4428
Uruguay	1	144
Brazil	39	3466
Chile	5	374
Cuba	3	993
Puerto Rico	1	207
Central America and Caribbean (15 countries)	7	845
Totals	1744	178734

THEN: In April, 1920, a little-recorded annual meeting of the American Association of Industrial Physicians and Surgeons (now the Industrial Medical Association) was held at New Orleans. There were about 20 physicians present, and the program consisted of seven presentations, at three sessions.

NOW: The Industrial Health Conference at Los Angeles in April, 1953, lasted eight days, and was participated in by seven organizations: the Industrial Medical Association, the American Industrial Hygiene Association, the American Association of Industrial Nurses, the American Association of Industrial Dentists, the American Conference of Governmental Hygienists, the United States Navy Industrial Health Organization, and the Atomic Energy Commission. There were 80 sessions, nearly 200 formal presentations, and 277 names in the index of speakers. The program was a 64-page booklet. There were 103 technical exhibits.

THEN: William S. Knudsen, announcing the establishment of the Knudsen Award: "*Many years ago, I, myself, was the entire first aid department in a plant where 800 people worked.*"

NOW: General Motors has more than 100 Medical Departments. "Many clinics in GM plants cost more than a substantial hospital and are equipped with every known medical device. Nearly 1,000 doctors, nurses, and technicians are employed." One of General Motors' Medical Departments, typical of all, lists its functions as follows:

FOR NEW WORKERS: (a) Physical examination. (b) Vision and hearing tests. (c) Psychiatric evaluation. (d) Laboratory tests—blood, urine, chest, heart, other. (e) Protective injections—smallpox, typhoid, tetanus, other. (f) Visual correction and protection—fitting occupational goggles or glasses. (g) Health promotion—discussing examination results with worker—giving him pamphlets on good health—participating in orientation program for new workers. (h) Job assignment—reporting worker's physical abilities to Personnel Department. (i) Job adjustment—consulting with personnel officer and foreman on special problems concerning emotionally disturbed or severely disabled workers. (j) Rehabilitation—recommending rehabilitation for unfit workers, or for those who would profit from it, and referring them to proper specialists or agencies.

FOR REGULAR WORKERS: (a) Annual physical examination. (b) Repeat laboratory tests. (c) Physical examination after absence for illness. (d) Periodic examination of workers exposed to special mechanical hazards for toxic conditions. (e) Periodic examination of workers with special disabilities. (f) Routine inspection of food handlers. (g) Discussing examination results with workers. (h) Reporting to personnel officer whenever a worker's physical abilities have either increased or decreased. (i) Consulting with personnel officer on questions of worker's physical fitness for job transfer. (j) Periodic health lectures, pamphlets, and films for workers and families, including such subjects as nutrition, fatigue, recreation, alcoholism, sonation, immunization, first aid, personal hygiene, home nursing, and seasonal hazards.

FOR SICK AND INJURED WORKERS: (a) Responsi-

Contrast

Upper left:
Dr. Andrew M. Harvey, Medical Director, Crane Co. (1896).

Upper right:
Crane Co. Medical Department (circa 1900).

Lower left:
Same (circa 1900).

Lower right:
Same (1917).

At left:
Crane Co. Medical Department, 1953.

Dr. Joseph H. Chivers joined Dr. Harvey at Crane Co. in 1920; succeeded him as Medical Director July 1, 1936.

bility for medical and surgical care of occupational illness and injury (in-plant care for minor cases—hospitalization for major cases). (b) Emergency medical and surgical care for minor non-occupational illness and injury to prevent loss of working time—cuts, colds, burns, other. (c) Maintaining contact with ill worker and private physician, hospital, or rehabilitation agency. (d) Physical examination after recovery from sickness or injury. (e) Discussing examination results with worker. (f) Reporting any change in worker's physical abilities to personnel officer. (g) Consultation on special problems concerning the job adjustment of emotionally disturbed or severely disabled workers.

OTHER FUNCTIONS: (a) Industrial hygiene surveys to control toxic conditions in plant. (b) Plant sanitation surveys and recommendations. (c) Cooperating with engineers on problems of heating, lighting, ventilation, and the human factors involved in machine design, organization of departments, production flow, and job combination or division. (d) Cooperating with job analysts in making physical demands studies. (e) Termination physical examinations for all workers leaving firms who have been exposed to special toxic agents. (f) Forms—records—statistics—evaluation of medical program—recommendations for improvement—researches—preparation of health promotion pamphlets and materials—liaison with outside agencies—participating in conferences of professional societies—publication of Medical Department's experience.

ANOTHER contrast is indicated on page 416. Two furnaces are being tapped simultaneously at Jones & Laughlin's new Open Hearth Shop, Pittsburgh Works. Individual furnaces of this shop have a net ton capacity of 250 tons. The shop is rated at 2,100,000 net ton annual capacity. Walt Whitman's description of the steel industry was written in 1960.

Trends

IN PRESENT-DAY industrial medicine, the emphasis is on:

1. More and more prevention as the focal point of the medical program.
2. More precise detection of existing and potential exposures in the work environment.
3. Expanded dispensary, laboratory, diagnostic, and industrial hygiene facilities.
4. The increased pursuit of health education.
5. Worker counseling.
6. Broadened insurance provisions.
7. Contemplation of the individual worker in his entire being; deeper appreciation of human dignity.
8. Wider use of and more dependence upon consultants.
9. Increased concern in the total work environment apart from the individual work point.
10. Rehabilitation as an essential of the entire medical program.
11. More physicians precisely skilled in industrial medicine.
12. The fitting of industrial medicine into the life and activities of the community.

CURRENTLY these things are being emphasized. If industrial medicine has any one outstanding need, that need is for more industrial medicine.

X-ray room, and dark room, in the Medical Department of Mutual Life of New York, New York City. All equipment by Picker X-Ray Corporation.

The Academy

THE American Academy of Occupational Medicine was formed in June, 1946, to meet the need for an organization of full-time physicians in the field of occupational medicine. The organization developed by the charter members has as the major objective the improvement in the practice of industrial medicine so as to achieve the highest maintenance and greatest improvement in the health of the industrial worker. The preventive aspects of industrial medicine, not only for occupational disease but also for the diseases common to the general population which result in the major cause of absenteeism and morbidity, are emphasized through the encouragement of research and investigation in the plant and in the laboratory. The Academy takes an active part in the education of medical, nursing, and technical personnel in the field of occupational medicine. The charter members, with their institutional identifications (as of 1946), were as follows:

JAMES M. CARLISLE, M.D., Merck & Co., Inc.
A. G. CRANCH, M.D., Union Carbide & Carbon Co.
E. E. EVANS, M.D., E. I. du Pont de Nemours & Co.
JOHN H. FOULGER, M.D., E. I. du Pont de Nemours & Co.
LEROY U. GARDNER, M.D., Saranac Laboratory.
GEORGE H. GEHRMANN, M.D., E. I. du Pont de Nemours & Co.
AUGUSTUS GIBSON, M.D., Merck & Co., Inc.
LEONARD GOLDWATER, M.D., Columbia University.
LEONARD GREENBURG, M.D., Division of Industrial Hygiene, New York State Department of Labor.
D. O. HAMBLIN, M.D., American Cyanamid Co.
FRANK M. JONES, M.D., Canadian Industries Ltd.
ROBERT A. KEHOE, M.D., University of Cincinnati College of Medicine.
ARTHUR F. MANGELSDORFF, M.D., American Cyanamid Co.
MELVILLE H. MANSON, M.D., American Telephone & Telegraph Co.
CAREY P. MCCORD, M.D., Chrysler Corporation.
W. D. NORWOOD, M.D., General Electric Co.
CARL M. PETERSON, M.D., Council on Industrial Health, American Medical Association.
JOHN J. PRENDERGAST, M.D., Chrysler Corporation.
W. A. SAWYER, M.D., Eastman Kodak Co.
LOUIS SCHWARTZ, M.D., U.S.P.H.S.
JAMES H. STERNER, M.D., Eastman Kodak Co.
JAMES J. WARING, M.D., University of Colorado.

The Academy has had a steady growth since its origin, and now numbers 50 members and 81 Fellows. Five annual meetings have been held, with the next annual meeting scheduled for Richmond, Virginia, February 11 to 13, 1954.

Active membership is of two types: members and Fellows. Continued participation in the Academy is dependent upon continuing full-time activity in occupational medicine. The reports of the annual meeting and the year's activities appear in the Proceedings of the Academy. The current officers are:

President—ALLAN J. FLEMING, M.D., Medical Department, E. I. du Pont de Nemours and Company, Wilmington, Delaware.

Vice-President—ARTHUR F. MANGELSDORFF, M.D., Calco Chemical Division, American Cyanamid Company, Bound Brook, New Jersey.

Treasurer—IRVING R. TABERSHAW, M.D., Division of Industrial Hygiene, New York State Department of Labor, New York.

Secretary—LEONARD J. GOLDWATER, M.D., Professor of Occupational Medicine, Columbia University School of Public Health, 600 West 168th Street, New York 32.

Railway Surgeons

WITH industrial environments a hundred feet wide and thousands of miles long, the medical men of the railways have their own kinds of industrial medical problems and their own ways of handling them. If, as has been said, industrial medicine in America had its genesis in the surgery of trauma, the railway surgeons were the first organized industrial physicians in the land. Their official organization, the American Association of Railway Surgeons, was founded in 1888. From about 200 then, its membership has grown to more than 3000 now. Theirs is a tradition of fine surgery. Long prior to the coming of workmen's compensation, they had established the practice of using only the best among consultants—a practice which, when later adopted by other industries, reduced the "free choice of physicians" formula to workable terms. The programs of their Annual Meetings, in April of each year, at Chicago, are a veritable "Who's Who" of the foremost men of the nation in the surgical specialties. Traditional, too, is their preference for the surgical designation. But the Railway Chief Surgeon is a Medical Director. In function, and in effect, his duties and responsibilities are the same—their application adapted to the attenuated environment in his charge. He multiplies himself through Division and District Surgeons, and in many instances his Medical Department is a hospital, ranking with the best. Sometimes he is entitled Chief Medical Officer or Chief of Medical Services. Whatever his title, he is recognized as a capable Medical Director in all the term implies. And his medical services, more often than not, are distinctive in quality. Indicative of this is the fact that the final publication by the American College of Surgeons of its surveys and approvals of industrial medical services in industry, December 1, 1950, includes 32 railroad medical services as having been given the ASC Certificate of Approval.

The Council on Industrial Health

American Medical Association

THE COUNCIL ON INDUSTRIAL HEALTH is the official agency in the American Medical Association designated to serve the medical profession at large in respect to developments in the field. It is expected to exercise leadership on all aspects of industrial medical relations, especially with associated technical and professional groups and with the public. A major share of its activity is designed to upgrade and maintain standards of professional competence and procedure.

The first steps towards the creation of a Council on Industrial Health date from the Kansas City Session of the House of Delegates in May, 1936. Dr. A. R. McComas, a delegate from Missouri, introduced a resolution which called attention to the chaotic nature of workmen's compensation administration, and to the need for better clinical and administrative management of occupational disease. In substance, this resolution recommended that the Board of Trustees continue and enlarge its study of industrial hygiene, occupational diseases, and particularly silicosis, to the end that uniform legislation be put into effect in all the states, to control these conditions. At this same session in Kansas City, the Committee on Industrial Dermatoses of the Section on Dermatology and Syphilology recommended that a central clearing house be established for recording and disseminating information on industrial skin problems. In consideration of the resolution and the report the Board of Trustees called a conference on March 12, 1937, which was attended by a group of physicians known to have given careful study to the problems of industrial health. The recommendation of the conference was that a Council be established and maintained by the American Medical Association. Subsequently the House of Delegates acted favorably on this recommendation and ordered the Board of Trustees to take necessary steps. In effect, therefore, the Council is a standing committee of the Board of Trustees, by whom appointments are made and budgets fixed. Each member serves a term of four years, three being appointed annually. Representation is drawn from the major segments of practice which have direct application—industrial-medical administration, clinical medicine, and preventive medicine, with the additional essential backgrounds of practical experience, as well as a good knowledge of theoretical, research, educational, and intradisciplinary aspects. The staff of the Council consists of a secretary and assistants, who act as executive officers to major committees dealing with scientific development, public service, professional relations, standards, and workmen's compensation.

THE FIRST meeting was held December 10, 1937, at the headquarters of the AMA in Chicago. Here, attention was largely directed toward organizational matters, in the furtherance of which a number of subcommittees were appointed, to define the scope of early activities, to prepare a set of rules under which the Council should act, and to develop a system of nomenclature to apply universally throughout the field. To a considerable extent, all subsequent activities have stemmed from the reports of these early committees. The later experience of the Council has been one of gradual expansion of functions, of a growing realization of the vast scope of industrial health and welfare, and of sharpened focus on those medical relationships which stand out as of fundamental importance. The original Committee on Scope had emphasized that major effort was needed in several directions if industrial health services were to spread and if medical standards were to improve. These were the creation of public interest and demand, the clarification of objectives, better intraprofessional communication and understanding, and better opportunities for individual physicians to serve in these fields based on improved professional training and on active interest and cooperation by local and state medical societies. Progress has been made in varying degrees in all of these categories, and, of course, there have been many ramifications of activity in collateral fields. In contrast to any specialized outlook, the Council concerns itself with the effects of growth and change in this field as they affect all elements in the medical profession.

The Council issues reports from time to time describing the basic aims of industrial health, the physician's place in the industrial picture, the administration of an industrial medical program, and relations with affiliated professional groups; and it has published, or stimulated the publication of, many statements on special industrial health and hygiene problems. It has worked closely with other councils, bureaus and sections of the AMA to upgrade standards of industrial medicine, surgery, and hygiene, and to intensify interest in health education and legislation.

The Industrial Nurse

THE NUMBER of full-time and part-time registered salaried industrial nurses functioning directly in industry throughout the United States is approximately 16,000. In 1940 it was about 4,500. The rate of increase during the last 15 years has been mostly steady, with some acceleration during the war years, and a drop-off shortly afterward. This, however, was only a temporary interruption of the upward trend.

The official specialty organization of the industrial nursing field is the American Association of Industrial Nurses. This was incorporated, not-for profit, in 1942, with high objectives—with which it has steadily refused to compromise. Its leadership is firm and farsighted — quietly recognizing the practical realities of nursing in industry, but always maintaining its vision of what it conceives to be the best interests of industry and industrial workers, of the individual industrial nurse, and of industrial nursing as a whole. It has a proper concept of the place, the principles, and the philosophy of the profession it represents. And it continues to grow, in size and in importance—more than a thousand new members were added in 1952. The Association headquarters are at 654 Madison Avenue, New York. Sara P. Wagner, R.N., Director of Nurses, Standard Oil Company of New Jersey, is the President; Gay Merrihue, R.N., is the Executive Director.

Sara P. Wagner, R.N.
President, AAIN

Gay Merrihue, R.N.
Executive Director, AAIN

IN THE Medical Department, under immediate physician supervision, the duties and activities of the industrial nurse are, foremostly, nursing. However, there have been some situations—hangovers from the past, and mostly within the penumbra of medical service appreciation—in which the managements had not taken full account of the necessity for physician supervision, possessing no adequate idea of the place of the industrial nurse, her limitations, or her potentialities of service within the scope of her profession. When the nurses first came into these situations, they brought a service about which management knew little. The prevalent idea was that once a nurse had received her RN, she needed no further development; that given supplies, she was equipped to do her job. Overlooked were such matters as her need for special indoctrination to the industry, and the organization level at which she should report in the plant in order to be effective. Also, her initial salary having been determined—usually on a community rate basis—it was too often considered as settled permanently. The AAIN early became aware of these misconceptions; these were some of the practical realities that had to be faced. But correction was not attempted by pointing out what was wrong. Instead, the Association constructively and tactfully pointed out what was right—that the basis for good nursing service in industry is management understanding and support. In pursuance of the positive, AAIN established a Management Advisory Council composed of 16 top executives from large and small companies. With the cooperation of the Council, it has made remarkable gains in showing management how better to utilize its nursing service. No small part of these gains can be attributed to the carefully formulated messages to management of which the following Statement prepared by AAIN's Management Advisory Council and widely distributed to executives is an example. Indicative of the gains, and significant as to how much can be accomplished through mutually sincere effort, is the fact that, in many of the situations to which they were directed, the "shoulds" and "musts" that sprinkle the text are being rapidly and satisfactorily superseded by the status of "is." For this, both AAIN and the managements concerned are to be commended. Now to the Statement:

To Management

A STATEMENT OF PRINCIPLES TO GOVERN MANAGEMENT RELATIONSHIP WITH THE INDUSTRIAL NURSE (Prepared by the Management Advisory Council of the American Association of Industrial Nurses):

Professional Responsibilities

MANAGEMENT should organize its health services with full recognition of the legal, ethical, and professional principles of medical nursing services in industry.

Management should arrange for a physician to have responsibility for the medical program in the plant. Such a physician may be employed on a full-time, part-time, per diem, or consultant basis, depending upon the size of the plant and other considerations. Provision should be made for the industrial nurse to act under the direction of such physician and be responsible to him for her professional activities which have to do with the practice of medicine.

The industrial nurse should not be called upon to give service or to make decisions upon professional matters involving the practice of medicine which do not properly fall within the field in which she is licensed to practice.

Administrative Responsibilities

MANAGEMENT should see that the industrial nurse knows to whom she reports administratively. Where the medical program is in charge of a full-time physician, management may provide that the industrial nurse will report to such a physician on administrative matters as well as those of a medical or professional nature.

In cases where a physician, even though part-time, spends regularly scheduled hours in the plant, management may provide that the industrial nurse report to him administratively during the time he is in the plant.

In all situations management should establish definite administrative responsibilities so that the industrial nurse will know the physician or other member of management to whom she reports and who has the authority to make administrative decisions.

Where certain administrative responsibilities may be delegated to a nurse in charge (i.e., where more than one nurse is employed) management should clearly establish the extent of her responsibilities.

Relationship to Supervision

THE relationship of the industrial nurse to supervisors and other members of line management must of necessity be maintained on a staff service or advisory basis. Thus, the industrial nurse should never assume authority to initiate action or overrule orders on matters properly subject to the decision of foremen or other members of line management. In dealing with employees, she should utilize every opportunity to work through the immediate supervisor concerned, but her right and obligation to appeal to higher levels of management when she feels that any decision of supervision will react to the detriment of employee health and the best interests of the company should be clearly established.

Policies

MANAGEMENT should establish definite written policies under which the medical program is to function. The industrial nurse and the physician to whom she has professional responsibility should participate in the formulation of such policies.

Employee Morale

MANAGEMENT should recognize that the industrial nurse, because of her professional status and the type of service she provides, is in an excellent position to make an important contribution to teamwork, harmony, and employee morale in the organization, and to the development of good relations in the community.

Filling Openings

MANAGEMENT should fill openings in industrial nursing positions with careful attention to the training, experience, and personal qualifications required to maintain high standards of performance in this specialized field.

Rates of Pay

MANAGEMENT should establish a rate of pay for the industrial nurse in keeping with her status in the organization and the contribution she makes. Her rate of pay should give recognition to the years of training required in her profession, the experience she has had, and the responsibility she assumes. It is natural to compare salary scales for industrial nurses with those for other nurses employed in the community. However, the salary of the industrial nurse should not be determined on the basis of this factor alone. It should be recognized that her salary should also bear a proper relationship to salaries paid for positions of comparable responsibility in the company, and should be set at a level above that of positions of lesser responsibility. Provision should be made for pay adjustments based upon individual merit as the nurse gains experience and increases her value to the company.

The nurse employed in industry has a professional position, but she also is a salaried employee with duties, responsibilities, privileges and benefits quite similar to those of other salaried employees. Management should see that she understands the importance and advantages of this identity with the company and with the employee group to which she belongs.

The industrial nurse should be given full information on company policies and procedures applicable to her job, e.g., her salary and the opportunities for advancement, vacation, holiday pay, overtime pay, disability pay, group life insurance, sickness and accident insurance, Blue Cross and Blue Shield plans, retirement plans, and similar programs.

Professional Advancement

MANAGEMENT should encourage the advancement and development of the industrial nurse in her profession. This can be done through membership in professional associations at the local, state, and national level, through attendance at conferences, institutes, workshops, and university classes.

The industrial nurse may be called upon to serve as an officer or committee member in her professional association. Management should recognize that acceptance of such responsibilities aids in the development of the industrial nurse and contributes to the advancement of professional standards.

The same policies and practices should apply to the nurse that govern other professional and management employees as to (1) participation and service in professional organizations and meetings, thereof; (2) the payment of dues; (3) time off with pay

Essentials of Medical Nursing Service in Industry

THE following statement has been prepared jointly by the American Association of Industrial Nurses, the Industrial Medical Association, and the Council on Industrial Health of the American Medical Association to clarify legal and ethical principles of medical nursing services in industry, both for members of interested professional organizations and for industrial employers providing any of the listed health services.

I. *The Value of Physicians and Nurses in Industry Depends Upon:*
   - A. Training, Experience and Aptitude.
   - B. A Position of Authority in the Industrial Organization.
   - C. Good Rapport with Workers.
   - D. Good Relations with their Professional Colleagues.
   - E. Thorough Knowledge of Work Environment and Processes.
   - F. Effective Use of Community Health Resources.

II. *A Health Service in Industry Should Provide:*
   - A. A Safe, Healthful Work Place.
   - B. Health Counseling and Health Education.
   - C. Personal Medical Services as Required for:
     1. Observance of Laws, Codes and Health Regulations.
     2. Emergency Medical Care.
     3. Health Conservation.
     4. Job Placement.

III. Personal medical services involving the establishment of a diagnosis and the definition of treatment or the performance of specific preventive measures are the function of the physician. However, it is desirable for the nurse to participate in such services if she acts under direct medical supervision or under indirect supervision such as is provided by standing orders.

Standing orders are defined as a written compend of directions outlining services and procedures, approved and signed by a licensed physician and acknowledged by him to be services and procedures that may be performed by a certain nurse under certain circumstances. Such orders should not attempt to delegate the exercise of medical discretion but should serve as authorization for approved routine procedures for common minor conditions, and as a directive for emergency care of more serious or complicated conditions, until the physician's arrival.

IV. In the absence of direct medical supervision, the nurse should acquaint her employer with the legal and ethical scope of her services. She should, at no time, exceed the limits imposed on her by training and licensure. If the nurse is asked to perform services exceeding her legal and ethical limitations, she should seek advice from the nearest official medical and nursing agencies.

V. In respect to industrial health services other than those listed as personal, the nurse can exercise considerable initiative. Practical limits must be based on her training, experience, and the availability of qualified consultants.

to attend such meetings; and (4) payment of expenses in connection therewith.

In-Service Training

MANAGEMENT should see that the functions of the industrial nurse are properly understood by those in the organization with whom she deals. Such understanding can be facilitated through a discussion of the medical program and the work of the industrial nurse in training conferences, and through articles in company publications.

It should also be recognized that the industrial nurse will be more effective in the performance of her work if she has the benefit of any in-service training courses which would broaden her knowledge and understanding of the company's activities.

General or Individual Problems

THE member of management to whom the industrial nurse has administrative responsibility should initiate conferences at periodic intervals with the industrial nurse to determine how the program is functioning and to discuss any general or individual problems that may have developed.

Maintaining Professional Status

MANAGEMENT should aid the industrial nurse by supporting her impartial decisions and protecting her professional status.

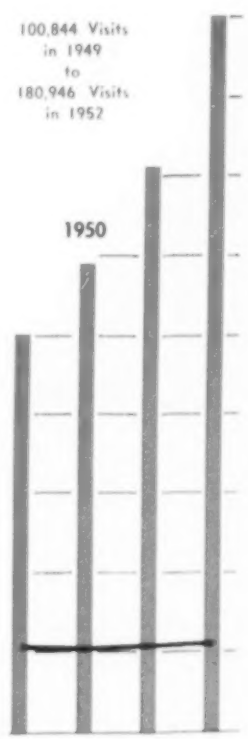
The industrial nurse occupies an unusual position in the organization. The nature of the service she renders hinges on respect and confidence. Her decisions, like those of the physician, therefore, must be based on factual information, and must be absolutely impartial. She serves management best when her primary concern is for the health of the employee. Her decisions should be made on a professional basis, and the integrity of decisions made on that basis should be maintained. The objectivity and impartiality of the industrial nurse should be protected by shielding her from the pressures of labor-management controversies. Any grievance or argument which may arise should be handled by other management representatives who have responsibility for answering such issues and complaints.

—Approved by the AAIN Management Advisory Council, July 15, 1953.

[NOTE: The American Association of Industrial Nurses, Inc., will make available to management upon request, copies of the following pamphlets, which may be found useful in implementing this Statement of General Principles: (1) "Duties and Responsibilities of the Nurse in Industry"; (2) "Recommended Qualifications for Industrial Nurses Working with Nursing Supervision"; (3) "Recommended Qualifications for Industrial Nurses Working without Nursing Supervision"; (4) "Qualifications of an Industrial Nurse."]

Medical Department Visits

MORE than any other member of the Medical staff, the industrial nurse is in first and continuing contact with the employees who visit the Medical Department. Their reasons for coming are primarily medical. They include the diversity of which the tabulation below is typical. These are the 1952 figures from a situation in which the plant population is about 13,000. In some plants where the work is not particularly hazardous, the number of visits for such purposes as preplacement and periodic physical examinations, counseling as to correction of conditions found, conferences regarding personal and family health problems, and for or on account of non-occupational incidents and conditions for which the employee would not ordinarily seek medical aid from his family physician, are in excess of the visits for occupational causes, and are increasing in proportion. In one plant with a work force of about 1700, the ratio of occupational to non-occupational medical visits has gone up from 1:3 in 1948 to almost 1:5 in 1952. This plant is notable for its excellent employee morale. The diagram at the right shows the rate of increase—1949 to 1952, inclusive—in visits, for all causes, to the Medical Departments of four of the recipients of the IMA Health Achievement Award.



CAUSES OF MEDICAL DEPARTMENT VISITS

Abdominal pain	31	Loss of weight	6
Abrasions, contusions, lacerations, etc.	4070	Menstrual	37
Amputations, trauma, etc.	68	Neuralgia, rheumatism, etc.	679
Burns	1152	Nervousness	74
Communicable diseases	29	Overweight	18
Ear	366	Puncture wounds	713
Eye	797	Respiratory	5366
Fainting	5	Skin—dermatitis	420
Fatigue	10	Skin pyogenic	523
Foreign body—eye	1021	Sprains, strains	812
Fractures, dislocations, etc.	312	Teeth and gums	194
Gastrointestinal	1344	Tumors and growths	39
Genitourinary	122	Miscellaneous	3051
Headache	903	Routine other than sickness accident (examinations, vaccinations, etc.)	590
Hernia	26		
Total			23,084

Industrial Hygiene

ALONG with Industrial Medicine, Industrial Hygiene also has come of age. Need for attention to healthful occupational environment began when man first started to work, but anything approaching scientific industrial hygiene was long in taking its place in the economic organization.

Recognition of this need is recorded in the early eighteenth century writings of Ramazzini, who suggests, as a control measure of a dust exposure, that stone-cutters avoid breathing through the mouth. A long-practiced method of testing the atmosphere in mines for respirability was the use of canaries. But from these small beginnings, progress over the early years was hardly perceptible.

With the twentieth century came recognition and prevention of phosphorus poisoning in the match industry. Pneumatic rock drills were introduced and projected increased millions of dust particles into the air breathed by increased thousands of miners and rock-tunnel workers. By the twenties, dust diseases had become well recognized, the episode of radium poisoning among the group of dial painters had shocked the country, and the highly publicized lead tetraethyl cases had tragically demonstrated the inadequacy of the venerable method of occurrence of cases as the basic means of recognition of a hazard. That method has been time-tested—and found wanting.

Then, almost explosively, modern industrial hygiene sprang into being. With its value in occupational disease control amply demonstrated during the twenties by such industrial hygiene divisions as those of the U.S. Public Health Service, Harvard School of Public Health, Connecticut State Department of Health, and certain insurance companies, scientific industrial hygiene took on an accelerating tempo. The depression of the early thirties, with its avalanche of silicosis claims, accentuated the need for facts on occupational health hazards and stimulated the organization of industrial hygiene divisions throughout the country.

Prior to 1932, only a handful of persons were engaged in industrial hygiene procedures. By the end of the next decade, nearly every industrial state had its industrial hygiene division, as did many of the insurance companies and an ever-increasing number of industrial concerns.

Today, after a brief 21 years, industrial hygiene has made a prodigious stride. The length of this stride is reflected by the expansion of industrial hygiene units within industrial concerns, governmental agencies, and insurance companies.

The Federal government has expanded its facilities and personnel for research in industrial hygiene and for assisting state and other governmental groups in the protection of the health of the worker. With the increasing number of potentially hazardous materials and processes in industry, the contributions of this program are obvious. Even where hazards are not man-made, the problems seem to introduce more difficulties than formerly. In checking mines for radioactivity, it was formerly considered adequate to confine investigations to uranium and radium mines; today, radon, radium A and radium C^1 are being found in sufficient quantities in non-radium mines in certain areas to require scientific investigation as to whether long-time exposure may be injurious.

Actual control work by government agencies is conducted for the most part by state, county and municipal divisions. These are staffed with medical, chemical and engineering industrial hygiene personnel and in some units with industrial nursing consultants. Practically all industrial workers in the country today are within the ambit of such official industrial hygiene agencies.

American Industrial Hygiene Association

Membership

1940 – 1953

Year	Members	Year	Members
1940	160	1947	427
1941	270	1948	493
1942	290	1949	548
1943	322	1950	621
1944	359	1951	707
1945	353	1952	763
1946	371	1953	899

Over this same period there has been a marked rise in industrial hygiene divisions among casualty insurance companies. For the appraisal and control of occupational disease hazards, some 21 of the leading companies, agencies and associations have personnel specially trained in industrial hygiene. Sixteen of the companies maintain industrial hygiene divisions, 14 of these having industrial hygiene laboratories.

IT IS within the industries themselves that the greatest expansion in industrial hygiene units has taken place over the past 21-year period. Prior to that time it was considered sufficient by most industrial concerns to depend principally on observation by the Medical Departments of actual injury to health as the criterion that a health hazard existed. This was supplemented by plant inspections by the safety engineer. However, where there had been no demonstrable injury to health, the safety engineer often experienced difficulty in obtaining correction of a condition which he considered potentially injurious.

During the years under consideration the larger concerns in industry after industry have added industrial hygiene personnel or have organized industrial hygiene units staffed with well-trained men. Included in the lengthening list are concerns engaged in manufacture and handling of electrical equipment, automotive equipment, aircraft, steel, cans, rubber goods, chemicals, pharmaceuticals, ferrous and non-ferrous castings, petroleum products, radioactive products, viscose rayon, glass products, and in mining, smelting, and refining operations.

IN ORDER to justify special industrial hygiene units, a concern must either be of appreciable size or involve health hazards of considerable severity. These units keep informed on exposures to plant conditions which may affect health of workers and check new installations for such conditions, stipulating the necessary measures for control. They are available for consultation with medical and safety men as well as with production personnel on matters related to industrial hygiene. It is the responsibility of the units to see to it that health hazards are recognized and exposures kept sufficiently low that injury to health does not occur.

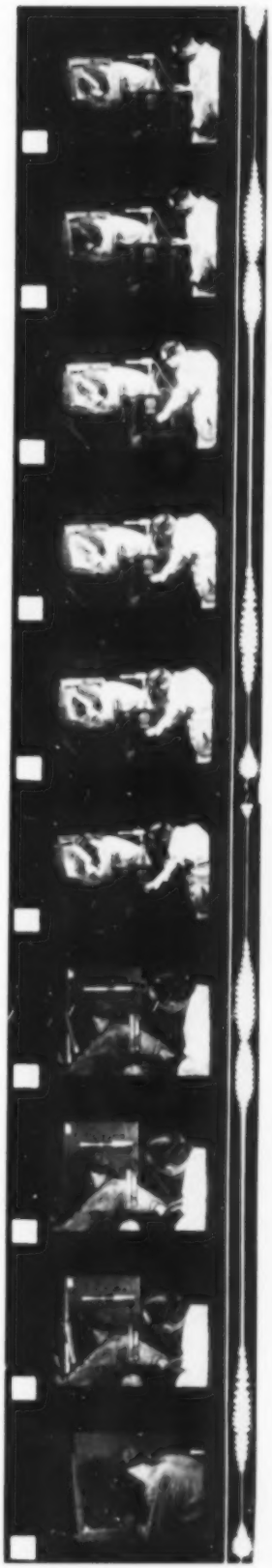
The value of healthful working conditions in furthering good industrial relations is becoming increasingly appreciated by management.

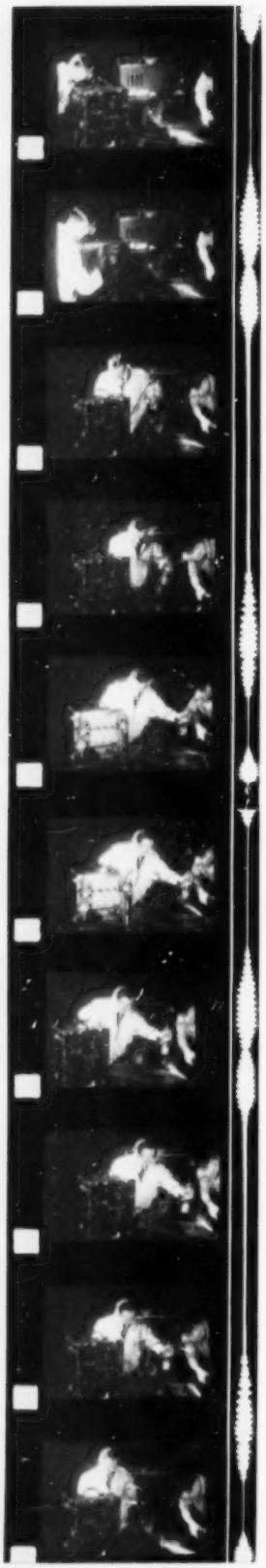
Well-trained industrial hygiene personnel requires training programs. Most of the persons engaged in this profession today have developed their know-how through work in the field. Since industrial hygiene has attained its accelerated pace, many universities have presented courses in industrial hygiene, though only three of the Schools of Public Health in addition to that at Harvard University are offering a full curriculum in the subject, these being University of California, University of Pittsburgh, and University of Michigan.

In 1936, a group of industries formed the Air Hygiene Foundation of America, Inc., with headquarters at Mellon Institute, Pittsburgh. Later the broadening scope of the organization caused its name to be changed to Industrial Hygiene Foundation. Staffed with highly qualified industrial hygiene physicians, engineers and chemists, this Foundation has been providing a valuable service for nearly two decades.

A number of institutes have been established in this field in the later years of the period under consideration. The research program of the Institute of Industrial Medicine of New York University is described elsewhere in these pages. Recently inaugurated are the Institute of Industrial Health of the University of Cincinnati (1947), and the Institute of Industrial Health of the University of Michigan (1950).

Prior to 1932, the Industrial Hygiene Section of the American Public Health Association and the Industrial Health Section of the National Safety Council were the principal organizations of the industrial hygienists. The APHA continues to present a program for industrial hygiene personnel, largely from a public health viewpoint. The program of the National Safety Council in this field tends quite properly to be directed to the safety engineer.





TOWARD the end of the thirties, industrial hygienists in fast growing numbers were becoming increasingly aware of the essentiality of an organization of their own. Though the drive for such an organization came principally from the non-medical industrial hygienists connected with industry, with some of the chemically trained favoring instead a separate section with the American Chemical Society, and with others of the engineering trained favoring a section with the American Society of Heating and Ventilating Engineers, it took an industrial hygiene physician to instigate the organization which became, in 1939, the American Industrial Hygiene Association. From a beginning of 160 charter members, this Association has increased to a total of nearly 800 members, all with at least three years' experience in industrial hygiene and graduation from a school of college grade. These are distributed through 38 states and 17 foreign countries. Some 22 local sections have been organized, mostly at industrial centers, and conduct meetings devoted to industrial hygiene subjects over the year. The Annual Meeting of the Association is held jointly with that of the Industrial Medical Association, the American Conference of Governmental Industrial Hygienists, the American Association of Industrial Nurses, and the American Association of Industrial Dentists at their joint Industrial Health Conference. A feature of the Annual Meetings is the Cummings Memorial Lecture and the presentation of the Donald E. Cummings Memorial Award for outstanding contributions to the knowledge and practice of the profession of industrial hygiene.

The official publication of the AIHA, the *American Industrial Hygiene Association Quarterly*, had its beginning in January, 1940, as the Industrial Hygiene Section of *Industrial Medicine*. Its existence as a separate journal began with Vol. 7, No. 2, in June, 1946.

The *A.M.A. Archives of Industrial Hygiene and Occupational Medicine*, formerly the *Journal of Industrial Hygiene and Toxicology*, serves as an additional organ of publication for the Association.

The mature stature to which its organization, the American Industrial Hygiene Association, has so sturdily grown is, in fact, the outstanding evidence of the coming-of-age of industrial hygiene.

Shortly before the formation of the AIHA, the industrial hygienists associated with official agencies organized the American Conference of Governmental Industrial Hygienists. Among the more important of their committee activities has been that of publishing each year a list of maximum allowable concentrations of atmospheric contaminants. Although offered without any official status, these MAC values have great influence on opinions, legal, official and otherwise, throughout the country.

AND thus is presented the striking contrast of industrial hygiene before and after 1932. Then it was existent only as a few isolated groups and individuals, with no formal organization, a scientific approach being made by only a few pioneering agencies, the period characterized chiefly by a great need. Today, truly "of age," industrial hygiene has penetrated wherever there is occupational activity and under the guidance of increasingly well-trained, professional personnel, with a strong organization of its own, with special industrial health institutes providing facilities for education, research and service to industry and through industry to every working person.

The demonstrated value of modern industrial hygiene has propelled it to its present sound position as an integral component in a complete industrial health program. This calls for no attitude of complacency in the accomplishments so far achieved.

Industrial hygiene must sustain its accelerated progress if its attainments are to reach into the tomorrow.

THE sequence shots on this and the preceding page are from the color motion picture film entitled "Occupational Health," produced by Medical Film Guild, Ltd., 506 West 57th Street, New York 19. The industrial hygienist is using an electrostatic precipitator to check the contamination of the atmosphere around a welder.

Industrial Medicine—World Wide

The Medical Department, Standard Oil Company (New Jersey)

FROM the frozen north of Canada to the deserts of Peru, and from the jungles of Colombia to those of Indonesia, hundreds of Jersey Standard employees are at work producing and refining petroleum and transporting it to various parts of the world for the use of industry and the home.

Many of these locations are in disease-ridden areas where medical facilities are inadequate, so that the field physician must exercise a great deal of ingenuity. Health education is often his most potent weapon in the fight against disease—and he must play the combined roles of doctor, diplomat, teacher, and public health officer.

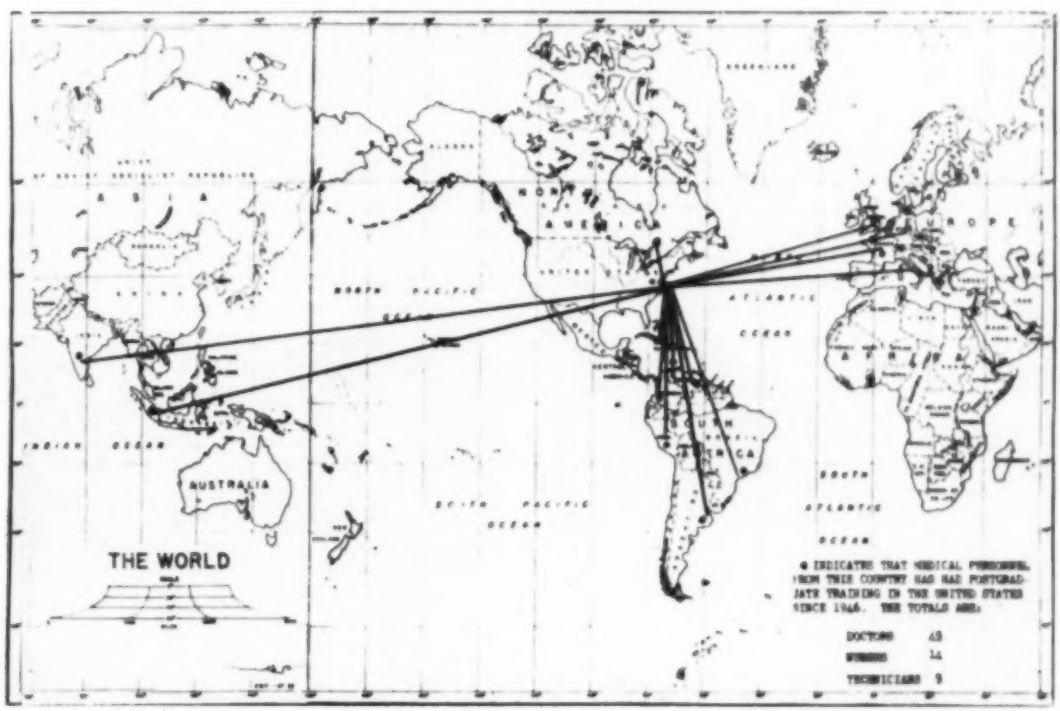
Far behind these outposts of drilling, refining, and transportation, other groups of physicians are exploring the environmental effects on men having daily contact with oil, and are seeking ways of lightening the burdens of their colleagues in the field.

These are the activities of the Medical Department of Standard Oil Company (New Jersey). The work consists of medical service of many and varied kinds. Prevention of disease is the watchword, and keeping employees healthy is the goal.

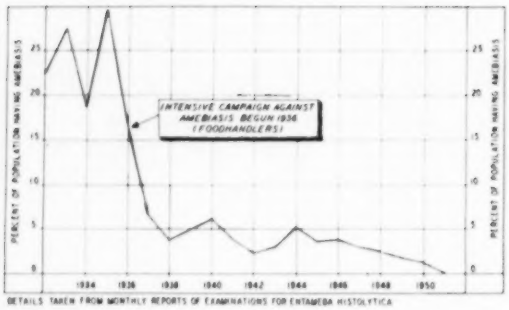
Inauguration of Medical Services

THIRTY-FIVE years ago, Standard Oil Company (New Jersey) established a medical program for its employees. Dr. Willard J. Denno, trained in teaching, public health, and internal medicine, was appointed Medical Director. Under his guidance, medical units were established in domestic refineries, and treatment for industrial injuries was provided at plant dispensaries.

In 1920, in recognition of the important role which should be played in industry by preventive medicine, the preplacement examination was established as a routine medical procedure. In this same year, a Marine Medical Department was set up for the purpose of providing medical services to employees of the Company's tanker fleet while at sea and ashore, and to maintain healthful working conditions on the tankers.



Geographical Location of Full-Time Medical Personnel of Affiliated Companies—Showing areas from which post-graduate students have come.



Lago Oil & Transport Co., Ltd. Amebic Dysentery. Percent of Infections Found.

The following year, Dr. A. W. Schoenleber, a Colonel in the United States Army, who had had extensive experience in public health and sanitation in tropical areas, was appointed Assistant Medical Director. He began an extensive series of visits to operating areas of affiliated companies in many parts of the world, and assisted in the organization of basic medical services for these affiliates, and aided in the planning of hospitals and clinics for areas where no medical facilities were available.

Period of Expansion

THE period 1928-1938 was marked by considerable expansion in the operating areas, particularly in Venezuela and the then Netherlands East Indies. Medical examination of vast numbers of prospective employees in these expanding areas revealed the need for prompt establishment of company facilities for the practice of curative medicine—for employees as well as for their family members. Malnutrition, unhealthful living conditions, and the lack of even rudimentary measures of sanitation, had contributed to the debilitated and diseased state of many prospective employees. Hospitals were constructed and were staffed with well-trained North American and National doctors and with North American graduate nurses, and the curative phase of medicine in the oil industry was begun. In conjunction with this phase, a program of instruction of employees and family members in the importance of proper sanitary measures, living habits and diet was established, and in 1938, in Venezuela, where malaria was a serious problem, a Central Division of Sanitation was instituted. Another noteworthy advancement was the opening at Tartagal, Argentina, of the Company-sponsored Central Camp School of Nursing which, during the past 16 years, has won honors and renown throughout Latin America for the high calibre of its teaching program as well as for the fine qualities of its graduates.

During this period advances were also made in the United States. The General Medical offices were moved from 26 Broadway, New York City, to the new RCA Building at 30 Rockefeller Plaza, where adequate space was provided for the inauguration of a new Company policy of providing voluntary periodic inventory examinations to all employees. A central statistical unit was also set up for compiling medical statistical reports based on information regularly submitted by the affiliated Medical Departments throughout the world. The first issue of *The Medical Bulletin* was published in November 1932.

Period of World-Wide Coordination

DURING the years 1938-1940, medical officers of Standard Oil Company (New Jersey) traveled more than 82,000 miles on inspection trips to the Medical Departments of affiliated companies to assist in the inauguration and development of new local medical units. While great emphasis was being placed at that time on proper sanitation and public health methods as a form of preventive medicine, affiliated companies were still largely practicing curative medicine. One thousand forty-one hospital beds were available under company auspices in six foreign countries. Complete medical care was furnished to employees, their families, and certain other smaller groups of persons—a total of 186,344 people. In 1941 the extensive scope of this medical program was made known to the professional world through an exhibit at the annual convention of the American Medical Association at which the functions, broad company medical policies, the medical accomplishments, and the scope of future plans were fully illustrated. Unfortunately, World War II caused temporary suspension of plans for the future, and medical activities were curtailed during this period.

In 1945 the first modern refinery Medical Department was opened at the Baton Rouge Refinery of the Esso Standard Oil Company and a Medical Research Department was inaugurated as a unit in the General Medical offices in New York City with the cooperation of the Standard Oil Development Company. A further achievement this year was the general acceptance of a broad company-sponsored postgraduate training program for full-time company physicians.

Under this program, which is still operative, capable doctors in the employ of affiliated foreign companies are brought to the United States where facilities for postgraduate study in medical schools, public health centers, and hospitals are made available to them.

Early Post-War Developments

IN THE spring of 1946, the first Company-sponsored International Medical Conference convened in New York City. Doctors from all affiliated companies were invited to participate in

Reception Room—Medical Department at 30 Rockefeller Plaza.

Dr. Kienzle discussing Jersey's Medical Program for Industry.

this conference with the result that 65 doctors representing affiliates in 14 countries were present. As a result of the conference sessions, a broad spirit of cooperation between management and Medical Departments, and among Medical Departments themselves, was engendered; management went on record as to its interpretation of the role of medicine in industry, and the principles of constructive medicine were accepted and promulgated. The conference closed with a testimonial dinner to Dr. W. J. Denno who had retired and had been succeeded by Dr. Robert Collier Page as General Medical Director, Standard Oil Company (New Jersey). In July, 1949, Dr. Kenneth R. Fourcher was appointed Associate Medical Director.

In recognition of the desirability of establishing in the Holding Company Medical Department a section where all administrative procedures, planning of hospitals and clinics, screening of applicants for medical positions in foreign fields, and a constant review of nursing problems and practices in affiliated hospitals and clinics could be coordinated, Miss Sara P. Wagner, R.N., was appointed Director of Nurses, and a Medical Administrator was added to the staff.

Following the termination of World War II, plans which had been held in abeyance owing to curtailed personnel and material shortages could now be reviewed and accomplished.

Among the developments of this period were:

Definite requirements for refinery and marketing medical units were determined from the standpoint of space, personnel, and equipment. These requirements were published in *The Medical Bulletin* and received wide circulation.

Diagnostic units were expanded at 30 Rockefeller Plaza, New York City, and in Caracas, Venezuela; Buenos Aires, Argentina; Rio de Janeiro, Brazil; Bogota, Colombia; London, England; and Paris, France.

Hospital facilities in Venezuela, Peru, and Aruba, N.W.I., were divided into specialized services of Medicine, Surgery, and Obstetrics, and were staffed with trained specialists in these fields.

Medical Departments were organized for Imperial Oil Limited, Canada, and Standard Oil Company of Egypt. The Marine Medical services were expanded to serve marine interests in Argentina, Aruba, Brazil, and Venezuela, and the Holding Company medical consultation service was extended to serve Arabian American Oil Company and Standard Vacuum Oil Company.

Eminent Specialists address doctors from affiliated companies, during courses in New York Office.

Training of Practical Nurses' Class—Creole Petroleum Corporation, Caripito, Venezuela.

Dr. J. M. Daley, Physician-at-large, Standard Oil Company (New Jersey), counseling an employee patient.

Dr. R. F. Schneider, Assistant Medical Director, Standard Oil (New Jersey), examining an employee patient.

Recent Developments

EARLY in 1950, the Marine Department of Standard Oil Company (New Jersey) was separated from that Company and established as the Esso Shipping Company. As a result of this move, the Marine Medical Department ceased to be a unit of the Holding Company Medical Department and became a department in the Esso Shipping Company.

In 1951 the Medical Research Unit was transferred from New York City and became the Medical Research Division of Standard Oil Development Company. This move enables the Division to utilize the research and development facilities of that company in its detection and elimination of industrial health problems related to petroleum products, and especially the development of methods of testing new materials. The Medical Research Division now comprises three sections devoted to industrial hygiene, toxicology, and clinical research. Supplementing the facilities of Esso Research Center, Linden, New Jersey, the Division works with the Kettering Laboratory and Institute of Industrial Health of the University of Cincinnati, the New York University-Bellevue Medical Center, the Albany Medical College, and the Sloan-Kettering Institute on toxicity studies.

Mr. W. P. Lehman, Medical Assistant, Standard Oil Company (New Jersey) taking an electrocardiogram.

In the spring of 1951, the Holding Company Medical Department sponsored a conference to which doctors and nurses of affiliated North American companies were invited. Thirty-one doctors, 21 graduate nurses, and one industrial hygienist attended these sessions. Several original papers were presented, and the meeting proved a most valuable forum for the discussion of mutual problems. Later the same year a Medical Indoctrination Course was given by the Medical staff for staff members of several affiliated companies. This course, the first of its type to be given by the Medical Department of Jersey, was planned in recognition of the fact that the medical program of Jersey and its affiliates had rapidly grown during the past years. Its purpose was to orient those attending in the broad principles and aspects of medicine as applied to industry and to provide an opportunity for the mutual consideration of medical problems in the realm of health maintenance of employees. The course was attended by doctors from affiliated companies located in Italy, Cuba, Venezuela, England, United States, Brazil, Indonesia, France, Peru, India, and Canada.

In 1952 the Medical Department announced the formulation of a residency training program in Medicine in Industry under which six months of the resident's training period would be spent in Medical Departments of Standard Oil Company (New Jersey) and domestic affiliates, and 12 months would be spent in the Medical Department of Lago Oil and Transport Company, Ltd., a Jersey affiliate located in Aruba, Netherlands West Indies. The object of this program, which

is limited to single graduates of approved medical schools who have already completed preferably two years' internship in an approved hospital, is to provide practical experience and training in the practice of medicine in modern industry and to help the young doctor in qualifying for specialist certification or degree.

The Present Medical Policy

THE Company's Medical Policy is based on the belief that: (1) employee health is of primary concern to management; (2) management has a responsibility with respect to the maintenance of employee health. This policy constitutes a framework for management action adaptable to local conditions and government regulations. It is best stated in terms of the four types of medical practice which make up the total program:

1. PREVENTIVE MEDICINE:

The accepted standards of sound preventive medicine are adopted to assure the employee sanitary and healthful working and living conditions to the extent that they are supplied or supervised by the company.

2. CONSTRUCTIVE MEDICINE:

Preplacement examinations make possible sound judgments as to whether an individual is physically and temperamentally qualified to perform his assigned duties. Employees are helped to maintain an optimal health level by: (A) Medical counsel. (B) Periodic health inventories at suitable intervals. (C) Diagnostic examinations. (D) Special examinations for employees handling toxic materials or in hazardous occupations.

3. CURATIVE MEDICINE:

Curative medicine is limited to the care and treatment usually given at the dispensary level, and to the normal handling of industrial accidents and occupational diseases.

4. EDUCATIVE MEDICINE:

The company provides medical guidance to the employee. It cooperates with the employee's private doctor as well as with governmental and other health agencies in the interest of the employee. It also provides graduate and other training for medical personnel when such action will improve or maintain the quality of the services.

While the preceding Medical Policy is that of Standard Oil Company (New Jersey), the policies of the affiliated companies are found to be quite similar, with only such deviations as may be occasioned by the terms of labor contracts or by governmental regulations.

Jersey Standard Philosophy

APPROXIMATELY 20 years ago, when operations were begun in tropical countries, it was urgently necessary to engage in the practice of curative medicine. Accordingly, as operations in the fields expanded and became permanent, hospitals were built in Venezuela, Colombia, Peru, Argentina, Aruba, and Indonesia, and were rapidly filled by the sick and injured nationals and their family members. Over the years little thought was given to the fact that these affiliated companies were engaging to an extreme and most costly degree in the practice of curative medicine which was neither called for by governmental regulations nor by the terms of any labor union contracts. As employee and family populations increased with ever-extending operations, new, larger hospitals were constructed in those countries and paternalistic medical care continued.

In November, 1949, Dr. R. C. Page called to the attention of management the fact that "By commitments of all kinds, we are now medically responsible for 150,537 people (including employees) in Peru, Colombia, Venezuela, and Aruba," where the actual number of employees was 37,746. "Our hospitals," he said, "are bulging with invalids—not employees, however, but their dependents. Should an industry whose basic function is to produce, refine, and market oil, be so involved in the actual practice of the medical profession?" Dr. Page suggested that the time had come for these companies to formulate plans leading to eventual separation of the hospital business from company operation. He indicated that this could be done by: (1) Encouraging the establishment of health services under private auspices with the company lending financial assistance for a limited period of time where necessary to achieve this; (2) by limiting curative care to legal obligations only; and (3) by teaching employees the meaning of health.

Where it is not possible completely to divorce hospital operations from other company operations, the establishment of policlinics at a distance from the actual hospital site has proved effective in reducing the number of hospital admissions. The following shows that when the clinic is located at a distance from the hospital, the number of cases hospitalized is considerably reduced:

AMBULANT CARE VERSUS
HOSPITAL CARE IN COLOMBIA

El Centro is producing area where hospital with adjoining dispensary is located.
Barranca Bermeja is refining area where only dispensary is located. It is 40 minutes by car from the hospital.
The locations have identical climate, same medical policy, and similar medical organization.

	No. Employees	% Employees Hospitalized
El Centro	1,555	125.00
Barranca Bermeja	1,877	68.73

An efficient dispensary service located at some distance from hospital facilities has decreased by 50% the necessity for hospital care.

Many factors come into play here. One is that the families of patients do not want them hospitalized unless it is absolutely necessary. Also, the doctors would much rather handle clinical cases themselves than refer them to the hospital. The tendency to refer patients to a hospital for a complete work-up, therefore, is greatly reduced when they can be given a complete diagnostic survey in the ambulatory clinic. A large saving can be made if as many people as can be satisfactorily cared for in an out-patient department are so treated. It is in the clinic that a health education program can best be advanced. The clinic can teach people how to avoid disease. It can show them how to prevent conditions which might later cause them to be hospitalized. In addition, because clinics cost less than hospitals to establish and maintain, more of them can be set up. With more clinics, preventive medicine can be brought to more individuals.

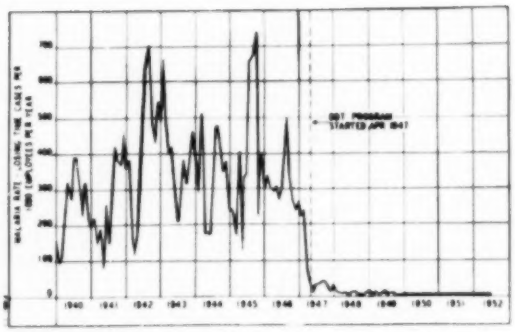
As a result of this new philosophy concerning company-sponsored medical services, three hospitals for which plans had been completed have not been constructed: one large new hospital building, ready to open, was leased to a religious organization for operation under its direction, and the company reserved a specific number of beds for use of its employees. A doctor in Peru received assistance from the company in building and equipping his own private clinic. One of the company's two hospitals was later closed; and at present negotiations are under way with a doctor in Colombia concerning a contract under which he will furnish medical care to company personnel in his own clinic.

The Jersey Standard Health Maintenance program rates among the top. The medical profession has long considered it a model program, and its practices and ideals have been promulgated throughout the country. The satisfactory results of the practical and efficient application of the principles of this constructive health maintenance program are illustrated by the following:

PREVENTIVE MEDICINE:

(a) *Malaria:* All methods for the control of this disease were adopted as soon as they were discovered.

Venezuelan government DDT crew spraying workers' homes during anti-malaria campaign.



Effects of DDT Program on Malaria—Caripito, Venezuela. Creole Petroleum Corporation Medical Department.

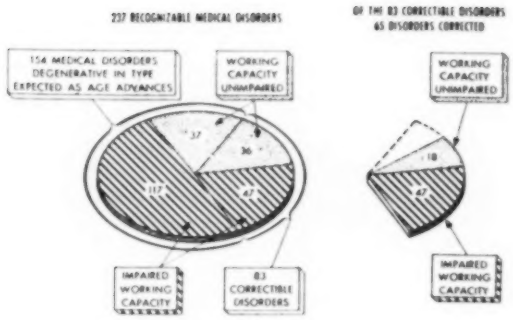
(b) *Cancer Control:* Catalytic cracking of petroleum was developed in the United States during the late war to meet the demand for immense quantities of high octane gasoline. The process is now here to stay. Certain mineral and lubricating oils have long been known to be carcinogenic to man and animals but little is known of other petroleum derivatives as potential cancer hazards. This new catalytic cracking, i.e., the subjection of oil to temperatures up to 950° F in the presence of aluminum and silica which serve as a catalyst, introduced factors which led to the suspicion that the high-boiling derivatives might contain carcinogenic hydrocarbons or other closely related compounds.

The research division of the Holding Company Medical Staff was alert to this possibility with respect to the occurrence of potential occupational disease. With the complete cooperation of management, a team consisting of five doctors, one industrial hygienist, nine scientists, with a suitable number of technical assistants, went to work. The potential causative fraction was determined, engineering methods were applied so that a minimal exposure would result, an educational program was set up, and all employees who were, and are, exposed in any way, receive thorough periodic medical inventories. The result to date has been that no cases of occupational cancer have occurred—and none is anticipated.

CONSTRUCTIVE MEDICINE:

(a) The detection of disease and impending illness in its incipiency, at a time that something positive, constructive and curative can be done about it at a price that the company employee can afford to pay.

(b) *Periodic health inventories at appropriate intervals.* The employee is thought of as a highly complicated piece of machinery; his capacity for tension has a limit beyond which it is not safe for him to go, and it can be dangerous for him to overload himself with responsibility as he



Disability of Executives

Of 290 executives examined, 200 had one or more medical disorders—237 recognizable defects in all. Of these defects, 154 were degenerative in type; of the remaining 83 correctible disorders, 65 were corrected. The scheme on the right shows the proportion of those whose disorders were not correctible (154) and those whose disorders were correctible (83). Also shown in each scheme are the numbers of persons of each group whose working capacity was impaired, and the numbers whose working capacity was not impaired.

ages. The pattern which is established in his late twenties and early thirties will determine his later load-carrying ability. The Medical Department strongly urges that each employee voluntarily submit to a periodic physical examination. Following a health inventory, the doctor assigns a date for the next such examination, and the employee is notified when this date approaches. In this manner the Medical Department plays a continuously helpful role in the life of the employee and provides guidance to him in learning his strong and weak points so that he may live within his medical capabilities. The medical staff at 30 Rockefeller Plaza, consisting mainly of Board men in Internal Medicine, provides diagnostic services for North American personnel on foreign assignment when they are referred back by the Medical Department of a foreign affiliate, and for such local personnel as may require this service.

When necessary, the services of private consultants are engaged to assist in reaching a diagnosis, their fees are paid by the company, and hospitalization is likewise provided if required. It is of interest to note that of 350 diagnostic problem cases during 1952, it was necessary to refer but 3% to hospitals for diagnosis. In all other cases, the diagnosis was established by the staff in the company diagnostic unit. Following determination of a definitive diagnosis, all expense for treatment other than for occupational disease or accident is for the account of the employee who has full freedom to choose his own doctor.

CURATIVE MEDICINE: The domestic companies do not engage in the practice of curative medicine. Once a diagnosis has been established, the employee is referred to his family physician and all treatment is his responsibility. At all times the companies cooperate to the fullest degree with the private physician of an employee, and this is evidenced by the cordial relationships which continue to exist between the private physicians and the domestic companies. Thus the work of the family doctor is *supplemented*, not *supplanted* by the physician in industry.

EDUCATIVE MEDICINE: Since the end of the war, educational activities of medical departments of affiliated companies, as well as of the Holding Company, have continued to expand. Courses have been given in company hospitals and clinics for the training of practical nurses and of laboratory technicians. Opportunities for study and postgraduate work in the United States are offered to oustanding doctors and nurses in the employ of affiliated companies.

Scope of Activities

MEDICAL services to employees of Standard Oil Company (New Jersey) and its affiliates are furnished through one of the following four methods:

1. The company establishes a Medical Department where doctors and nurses are employed on a full-time basis.

2. The company engages the services of a well-qualified private doctor to provide specific services in his own office. The company is then billed on a fee basis. (In some instances, the company provides the facilities.)

3. The company enters into a contract with a private clinic or a private doctor to furnish specific medical services for a specified regular fee.

4. The company financially assists a private doctor (in foreign locations only) in establishing his own clinic. In this case, the company pays the doctor for services rendered to employees, and the employee pays the doctor for services to any of his dependents.

Naturally, selection of the method to be used in providing medical services is determined by the factors of employee population, permanence of operations in the area concerned, and availability of suitable private doctors and clinics.

Full-time Medical Departments are currently in operation in several areas of the United States, Canada, England, France, Italy, Germany, Indonesia, India, Aruba, Cuba, Venezuela, Columbia, Peru, Brazil, and Argentina. In most other areas of operation, part-time medical personnel, or fee-basis doctors are available in Australia, India, Japan, Denmark, Norway, Sweden, Finland, Austria, Belgium, Holland, Egypt, Chile, Uruguay, the Antilles, West Indies, Central America, and South Africa.

The total number of employees for whom medical services were available during the year 1952

was 120,706. The total number of Medical Department personnel was 1,744 of which 246 were full-time and 46 were part-time doctors, and 270 were graduate nurses. During the year there were 276,201 dispensary cases, 6,133 employees were hospitalized for 84,649 days, and 81,619 employee physical examinations were performed.

The Medical Department, Standard Oil (N.J.)

THE Medical Department at 30 Rockefeller Plaza, New York City, provides medical guidance to the employees of Standard Oil Company (New Jersey), Esso Shipping Company, and Standard Oil Development Company located in the Rockefeller Center area, and to employees of Creole Petroleum Corporation in the Empire State Building. It acts as clearing house for the medical records of all United States personnel assigned to affiliates abroad.

It has the responsibility for making recommendations to the Board of Directors on medical policies and program. By counsel and advice to affiliated companies, it is responsible for achieving, to the extent desirable, a coordination of medical services offered by company interests.

Its staff members are familiar with the medical problems of the affiliated companies and keep fully informed on the effectiveness of their medical programs, the competency of their key medical personnel, and the future plans of their Medical Departments.

This Department is also responsible for maintaining an organization to provide competent medical service to the employees of the company and, upon request, to the employees of affiliated companies.

This story, describing the development of the medical organization of Standard Oil Company (New Jersey) and its affiliates from its modest beginning in 1918 to its present world-wide medical service, graphically illustrates how the wisdom and foresight of one individual was instrumental in establishing a fundamentally sound program which his colleagues and successors have continued to carry out and adapt to the changing needs of modern Industry.

Physicians from the Holding and Affiliated Companies attending the Medical Indoctrination Course

Standing, left to right: Dr. Fernando Diaz, Brazil; Dr. Enrico Aonzo, Italy; Dr. T. E. Aramburu, Cuba; Dr. F. J. Rummel, Massachusetts; Dr. J. M. Daley, 30 Rockefeller Plaza, New York; Dr. R. M. Adams, Louisiana; Dr. Guillermo Gorbitz, Peru; Dr. R. Majumder, India; Dr. Gordon Sinclair, Canada. Seated, left to right: Dr. E. H. Capel, England; Dr. Alfonso Bortone, Venezuela; Dr. R. C. Page, 30 Rockefeller Plaza, New York; Dr. F. V. B. Dumoulin, Indonesia; Dr. J. J. L. Garelly, France.

The Small Plant

INDUSTRIAL health programs are operated in thousands of companies—large, medium, and small—throughout the nation. Every year, more and more companies of every type are starting such programs or expanding or improving the ones they have. There is a good reason for this. The programs are doing the job that they were designed to do; they have become another efficient management tool.

The basic elements of a sound and effective program are well-known. Years of experience and experimentation by thousands of companies are compressed into the simple and effective steps here given. Every company—no matter what its size or product—can have a successful program and reap the benefits that flow to all concerned, employee as well as employer.

The simple elements here outlined are the essence of a successful program. They will work in a shop with 10 employees or in a factory with 10,000 on the payroll. Like all other industrial management techniques they can be applied so that they meet the needs and problems of the individual company in a manner well within the capabilities and means of the company and the available facilities.

Programs vary from company to company in accord with such factors as the number of employees, the availability of medical personnel and facilities, the kinds of services available through medical and hospital insurance plans, and the degree to which they integrate into, and fully utilize, all community facilities.

The differences between big-company and small-company plans lie only in the way in which the services are provided for the employees. *There are no fundamental differences between big-company and small-company programs.*

The experience of thousands of small companies proves that by making full and proper use of all available facilities in the community, *every small plant can provide its people with big-company protection at small-company cost.*

Successful programs in companies of all sizes have a common characteristic—they are woven into the day-by-day operations of the plant. They have become as much a part of operations as production, sales or safety.

To insure the whole-hearted acceptance of the program by the employees and to achieve the vital objective of gaining their cooperation and participation it is necessary:

1. That management itself be thoroughly sold on and enthusiastically support and display sympathetic and genuine interest in the program. It is vital that management make it clear to employees that the primary purpose of the program is to benefit them. Management benefits only as employees remain healthy and safe.

2. That the program be a "plant" activity. The "plant" doctor and nurse come regularly into the factory, to see and to be seen. They are familiar with the plant working conditions, processes, and hazards. They are capable of developing an effective and adequate program. With the complete confidence of both employees and employer, a plant doctor and nurse are a strong and effective link in the chain of employer-employee communications.

The essence of a health program is that it is preventive—its primary function is to prevent damage and to maintain the health and safety of the employees. Here is the framework of such a program:

Curative Services

1. PROMPT and efficient treatment of all occupational injuries and sickness.

2. Treatment for minor non-occupational injuries and illnesses so that the employee may remain on the job. Of course, when continued or further treatment is indicated, the employees are referred to their personal physicians or dentists.

Preventive Services

1. PREPLACEMENT PHYSICAL EXAMINATIONS. The proper use of these in matching the physical capacities of the applicant with the physical demands of the job asaures that the man is placed in the proper job. As a result, hundreds of lives have been saved and thousands of accidents averted. This technique also permits the company to utilize effectively the fine capabilities of the physically limited and older workers.

2. VOLUNTARY PERIODIC PHYSICAL EXAMINATIONS. These are made available to all employees at least once a year. *Periodic medical examinations* are given employees who are exposed to potential or actual toxic materials or hazardous processes. Post-illness and post-accident examinations protect the employee, his co-worker, and his employer.

3. HEALTH EDUCATION programs cover such topics as personal hygiene, nutrition, disease prevention, first-aid instruction, safety, the vital necessity for early diagnostic and medical care, proper rest and recreation, and personal counselling on individual health problems.

4. PLANT HYGIENE AND SANITATION. The con-

trol of toxic materials, air contamination, lighting, ventilation, housekeeping, and, in general, all aspects of the plant environment, is an important element in maintaining the health and safety of employees.

Facilities

ADEQUATE facilities are made available for rendering these services. While these facilities may be within the plant, in the usual small-company situation they may be located in the office of the plant's part-time physician or some other local facility. Within the plant there is provision for the quick and effective application of first-aid measures in cases of accident.

Health Records

ADEQUATE medical records are maintained and periodic analysis of health experience made. The facts are confidential. It is vital that the doctor-patient relationship be respected.

The data obtained by the doctor in this relationship are a proper basis for recommendations to management for the protection of the employee. Suitable consultants are available in case of need.

How Small Plants Can Obtain These Services

THOUSANDS of small plants have such programs in operation, tailored to their needs at a reasonable cost. The services may be obtained on a group-sharing or single-company basis.

Employer-Group Sharing

EMPLOYER-group sharing plans are an efficient means of providing adequate health care at a reasonable cost. The technique has proved highly successful. For example, the Allan Manufacturing Company in Hartford, Connecticut, participates in the well-known Hartford Plan. Mr. Ellsworth Grant, Vice-President of the Company, has credited the program with reducing both compensation premiums and absenteeism by at least 50%.

The advantages of such plans are many—not the least of which is their flexibility. In the Hartford Plan there is no central clinic; the Petrie Plan, another successful program, does have one. These differences reflect the varying conditions of the participating companies.

No matter what form the employer-sharing plan takes, the fundamentals are always present—the services provide preventive care and medical personnel comes into each plant regularly.

Here are a few of the advantages of group-sharing plans:

1. When a central clinic is used the *capital cost to each company is much reduced* because it is shared.

2. The amount of equipment and space required is less than the amount that would be required if each plant were fully equipped—there is a *higher degree of utilization of the facilities.*

3. Whether or not there is a central clinic *the services are, in effect, on a full-time basis* because in an emergency the whereabouts of the doctor and nurse are known and they can get to the plant in a short time.

4. These plans make *recruitment of medical personnel easier.* It is often difficult to secure the services of a community doctor for a part-time single plant program. When several plants are included in the plan, it is easier to interest a physician in the problems of industrial medicine from the preventive aspect. Understandably, the more favorable remunerative promise in plant-group practice is also a factor. In the case of nurses, the steady employment and regular hours offer a substantial inducement to engage in industrial work.

5. There are various administrative advantages: (a) the savings resulting from group purchasing; (b) the elimination of many overhead expenses; (c) the standardization and centralization of record keeping, etc.

Such projects are community ones; they are built in the light of local conditions, by local people and for the benefit of local people. No rules can be laid down—it is a problem that can only be solved in the American way at the town level.

Single-Company Service

THERE is little question that employer sharing of medical personnel and facilities is an efficient method of providing medical care that is growing steadily in popularity.

On the other hand, the typical health program is on a single-company basis utilizing the services of a local physician and nurse for regular periods each week.

It must be carefully noted that the on-call doctor is not sufficient; to be successful, the physician comes to the plant on a regular schedule. He is acquainted with conditions, processes and hazards in the plant. He makes periodic plant inspections as a basis for his recommendations to management.

The Physician

MANAGEMENT takes the initiative in seeking out a local physician with an interest in industrial medicine and a proper background. Such a

physician can be found by contacting the local county medical society or the company's compensation insurance carrier.

For the mutual protection of both parties, many companies formalize the relationship with a written contract. Such matters as hours, services, fees, the protection of the doctor's professional status, the facilities to be provided by each party, the insurance protection required, and the obligations of both the company and the physician are spelled out in detail.

These doctors are usually paid on an hourly basis, although salary arrangements are not unusual. Hourly rates generally range from $8 to $12 an hour. The physician, on an average, spends about three hours a week in the plant for every 100 employees on the payroll. The amount of time spent in the plant is influenced by many factors: the processes and hazards, the relative number of male and female employees, etc. As an example, one company has the physician visit the plant one hour a week. His fee is $25 a month plus $2 for every preplacement examination he performs.

The physician is under the supervision of the owner or an executive of comparable rank. He prepares written and signed standing orders for the nurse. To neglect this practice seriously impairs her usefulness.

The first-aid people also receive written and signed instructions.

The Nurse

NURSING service may be obtained also on a part-time basis. Not infrequently several companies share the full-time services of an industrial nurse. Her salary is prorated among the cooperating companies on the basis of the amount of the nurse's time spent in each plant.

During the current shortage of nurses many companies have turned to visiting nurse associations for service. In addition to the usual sources, companies have checked to find inactive nurses residing in their communities. For example, a nurse with family responsibilities may be willing to accept a part-time position.

Experience indicates that plants with from upwards of 250 people can utilize and afford the services of a full-time nurse. In plants employing less than that number the nurse spends about nine or 10 hours a week in the plant for every 100 employees.

Nursing service fees average about $2 to $3 an hour.

Some companies located in communities with severe shortages of nurses have found that veterans who have served with the medical services make excellent first-aid men and attendants. Pharmacists mates, for example, have received excellent training in the Navy.

The First-Aid Attendant

SINCE the medical personnel is only in the plant a part of the working day, the uncovered time is protected by at least two or more employees on every shift. They have a current certificate of proficiency in first-aid from the American Red Cross or some other acceptable organization. They have a refresher course at regular intervals of not more than every three years.

The Facilities

A PLANT dispensary or first-aid room is a necessary part of sound plant medical service. This is always true whether the services are obtained on a single-company or an employer-group-sharing basis.

The size of the facility will depend primarily on the number of employees to be served, as well as the hazards of the individual plant. In plants with less than 200 employees the average size of the room is usually about 125 square feet. Somewhat larger plants (i.e., from 200 to 500 employees) require about 300 square feet. The room is located conveniently to the work areas, but separate from them and in as quiet a place as possible. The equipment and layout are determined by the plant doctor and in accord with any local or state laws that may apply.

If a practical nurse or first-aid attendant is in charge of the room, only first-aid may be given —and that in accordance with accepted first-aid procedures and the plant doctor's instructions. The doctor is responsible for, and approves, all medications.

In very small plants where a first-aid room is not feasible, only a cabinet is utilized. It is vital that only the qualified first-aid attendant, operating under the plant doctor's instructions, administer first aid. The name of the attendant is posted on the cabinet and he records all aid given. The cabinet is locked and the key is in the possession of the first-aid man or the foreman.

Sources of Information

PARTICULARLY when setting up a group-employer plan, companies have been careful to consult with medical authorities. Not only do they receive valuable advice and suggestions, but they avert problems of an ethical and legal nature.

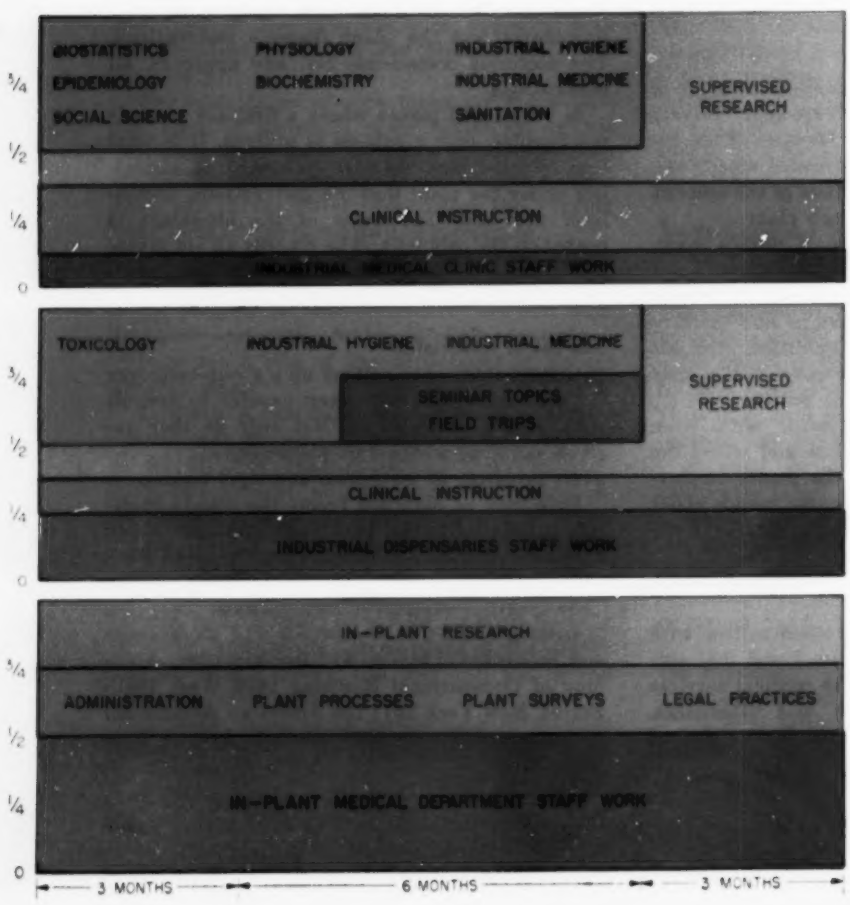
Help may be obtained from: the county medical association; the insurance company; and national organizations such as the American Medical Association, Council on Industrial Health (535 North Dearborn Street, Chicago 10); the Industrial Medical Association (28 East Jackson Boulevard, Chicago 4); the American Academy of Occupational Medicine (600 West 168th Street, New York 32); the American Association of Industrial Nurses (654 Madison Avenue, New York 21).

Graduate Education

PERHAPS the most significant development in the recent history of occupational medicine has been the establishment in a number of American universities of programs to train specialists in this field. Beginning with an 18-month course of training designed by the University of Pittsburgh's pioneer teacher of industrial medicine, Dr. T. Lyle Hazlett, the years following the close of World War II saw the creation of new training centers and the recasting of old ones to conform with the concepts of occupational medicine that had crystallized during the war. These are located at Cincinnati, Columbia, Johns Hopkins, Harvard, Michigan, New York, Pittsburgh, Rochester, and Yale Universities.

The base of training within a university is actually or functionally an institute which exists for this special purpose. The institutes or their equivalents are administratively located in university graduate schools or, where such exist, within schools of public health. They are centers of research, and their staffs may provide consultation services in the field of occupational health. Their faculties take primary responsibility for graduate training, but depend throughout the training period upon the help of associates in teaching hospitals, in other colleges of the universities in which they are located, in affiliated or neighboring educational and social institutions, and in selected industrial plants.

The beginner must bring to the training program in occupational medicine a real competence in clinical medicine. To this foundation several new capacities are to be added. He must develop a grasp of the statistical principles needed to manage the health problems of groups of people while at the same time he retains his interest and skill in the handling of problems of individuals. He requires a knowledge of disease etiology and pathogenesis based in the physical science fields, and an understanding of the research methods applicable to the solution of the kinds of problems he is certain to meet in industrial practice. To these things are added a competence in administration, and an ability to apply all that he knows in an effective program of prevention. To accomplish all this, the institutes are shaping up a three-year course of training which is described in a series of charts and legends.

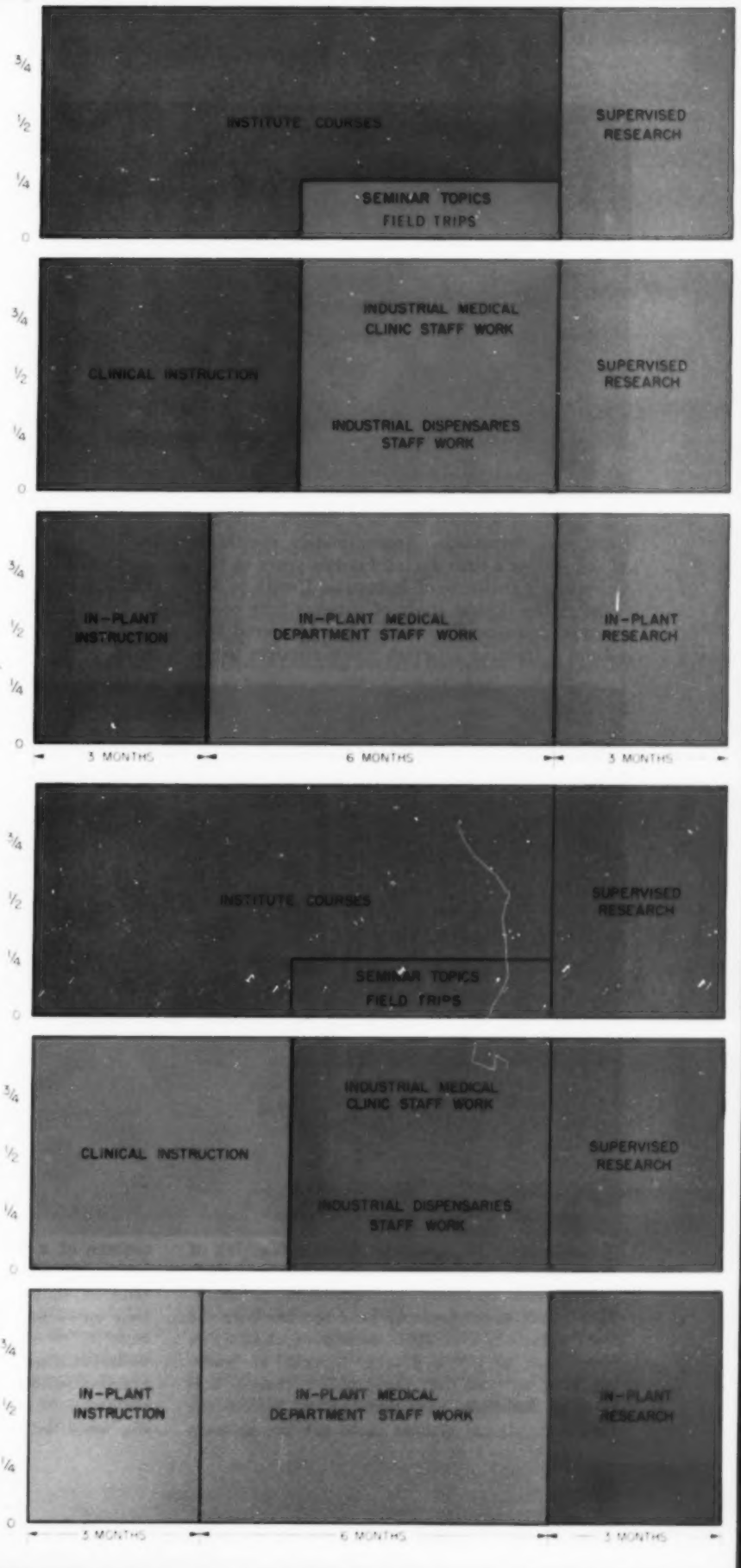


THE chart schematically presents the content of three years of training, blocked to scale in terms of time. The areas in red indicate courses of didactic instruction; those in blue represent kinds of supervised work; and those in green denote time spent in supervised research. The first two years are spent at an institute, and the third at an industrial plant medical dispensary whose Director is affiliated with the faculty of the institute. The basic science courses are biostatistics, epidemiology, environmental physiology, biochemistry, and sanitation. The applied sciences are toxicology, industrial hygiene and health physics, practice of occupational medicine, and administration. In the clinical field, emphasis is placed on the diagnostic portions of medicine and certain minor specialties. Training in restorative surgery is carried at least to the level which assures competence in

the selection of operative procedures and the evaluation of the work of others.

IN THE chart at the right the three years of graduate training are again blocked to scale, illustrating now the proportions of time spent in three kinds of activity. Time spent in didactic courses is shown in blue; that spent in supervised work in red; and that in research is green. When training is limited to a single year, that time is utilized for the didactic courses. The largest fellowship program in existence now, that of the Atomic Energy Commission, provides two years of training: the year of didactic courses at an institute and an in-plant year at one of the Commission's facilities. The full three year plan makes possible the provision of the clinical training and research experience considered essential for the average candidate.

THE FINAL chart schematically presents the location of primary responsibility for portions of three years of training, blocked to scale in terms of time. The portion of time for which the institute assumes direct responsibility is shown in blue; that for which the clinical teaching center assumes responsibility is shown in red; and that for the affiliated industrial plant is in green. Even in the latter two, final responsibility for the curriculum and its results rests with the institute. This analysis of the training program sharply sets off its unique nature, and distinguishes it from training programs in other medical specialties which are provided essentially at clinical centers. Reasonable variations from the pattern shown in the chart, to suit the needs and opportunities of different situations, are to be expected.

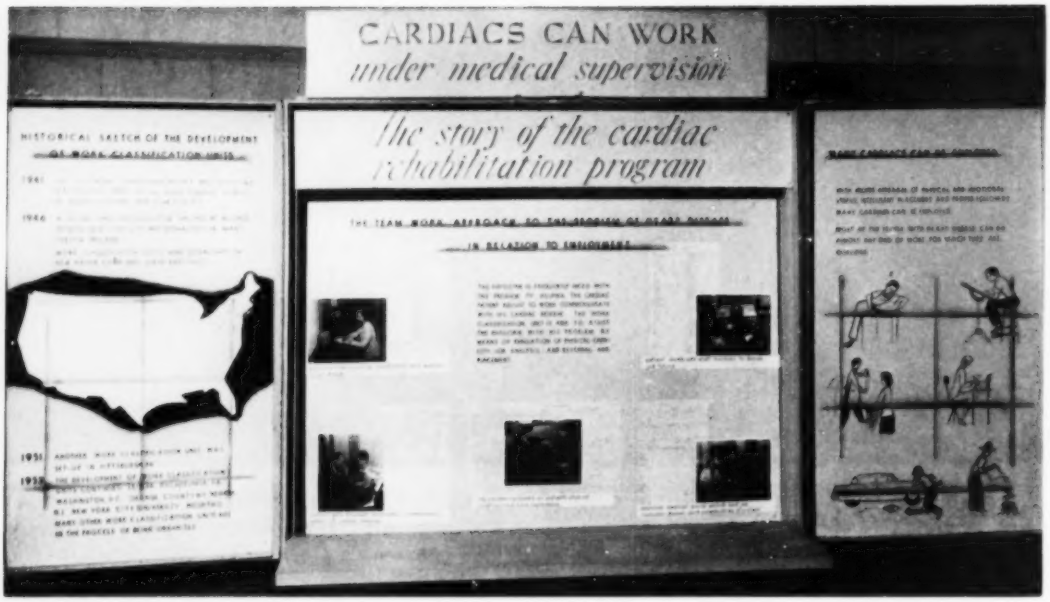


ABOVE is illustrated a group of faculty and students at the University of Cincinnati, observing results of a patch test on a patient with occupational dermatitis. Approximately one-third of the trainee's time during his two years at the university's Institute of Industrial Health is devoted to the clinical study of patients with occupational diseases. This center has pioneered the plan of a training program which requires three years for its completion—two years at the institute and one at an affiliated industrial medical service. World-famous Kettering Laboratory at the University of Cincinnati was the foundation upon which the first training institute for industrial physicians was formed. The plan has caught on, and establishes the framework in which training in occupational medicine is taking place today.

THIS photograph illustrates bedside teaching of occupational diseases by the staff of New York University's Institute of Industrial Medicine. This aspect of the training program has been the most difficult to arrange because occupational disease cases do not ordinarily appear at teaching centers, and for the further reason that medical faculties have been slow to concede that occupational disease cases are the primary concern of a single specialty. Progress is being made in the solution of both problems. The industrial physician is not only uniquely qualified to pass on occupational etiologies but, through his capacity to communicate with workers and his understanding of the implications of jobs for non-occupational illnesses, he also promotes an understanding of the total patient in the teaching ward bed.

AN ESSENTIAL feature of graduate training in occupational medicine is the development of a first-hand acquaintance with industrial plants, their machinery and processes. The trainee learns early the concepts and vocabularies which not only permit easy communication in matters pertaining to industrial health problems, but assure a capacity to make first-hand observations from which he can think through such problems by himself and in his own terms to solutions that are attainable and practical. The photograph above shows a class of graduate students of Yale University together with faculty members and plant personnel engaged in the study of a particular job at a nearby Connecticut factory. The graduate training centers happen to be so located as to have accessible for field studies of this kind a wide range of illustrative plants.

INDUSTRIAL hygiene, the science through which an optimally healthful occupational environment may be achieved, is a cornerstone of the graduate training program. An understanding of the possible adverse action of physical and chemical agents encountered on the job is dependent upon an application of the dose concept, with which the trainee is already familiar, to such factors as can be identified at the place of work. The discovery of these factors is a qualitative exercise, but satisfactory assessment is dependent upon precise quantitation. The photograph above shows an ophthalmologist affiliated with the Institute of Industrial Health of the University of Michigan making a measurement of light intensity.



OCCUPATIONAL medicine concerns itself with all health problems that are caused or aggravated by occupation, or which have their solution in some aspect of occupation. That work can be healing is too often forgotten; or that it might be therapeutically supportive in cases of incurable disease seems to occur only to those physicians interested in rehabilitation. The panel shown above illustrates an achievement at Columbia University: the first cardiac-work evaluation clinic, which has set the pattern for similar clinics across the country. Studies currently carried on at Columbia are concerned with the effects of employment on the course of heart disease. Some training in rehabilitation is provided at all of the university centers.

THE distinguishing characteristic of modern industrial health is the belief that no cases of occupational disease need ever occur. For an increasing number of substances the control program moves from toxicological experiments with laboratory animals to the building of safety into production facilities without the interim development of a clinical experience. The irreducible part to be played by the physician in this circumstance is the performance of routine examinations of potentially exposed workers to discover evidence of failure of the prevention program. A more satisfactory arrangement, from all viewpoints, is that in which the physician participates at every stage of the program. It is not necessary that the physician possess the capacity to perform in all of the fields involved, but he must possess a high order of literacy in each of them. At the left is an exposure chamber with which students at the University of Rochester develop a first-hand experience with methods of determining toxicities to animals of air-borne substances. The trained specialist in occupational medicine, although no toxicologist, is expected to exercise independent judgment upon the design of an experiment, the quality of the data it produces, and the conclusions to be drawn therefrom.

AS MIGHT be expected, studies in toxicology comprise the principal laboratory research activities at a majority of the institutes. The nation's burgeoning chemical industry continuously introduces new products or new uses of old ones, posing problems in industrial toxicology whose adequate definition and solution must be based upon a combination of good animal toxicity studies and reliable field observations of exposed workers. Maximum allowable concentrations of most chemicals become established on the basis of the dose at which the earliest measurable injury can occur in man. In other cases, such criteria as odor or respiratory tract discomfort are used. The photograph above shows the laboratory set-up at Harvard University for studying the effects on man of breathing subthreshold concentrations of various gases and aerosols. The valves in the breathing circuit can be manipulated without the knowledge of the subject, whose response is recorded on a tape from which the details of respiratory performance are read. In this as well as other centers the use of experimental methods to quantify harmfulness has been extended beyond the field of chemistry to include such environmental factors as heat and cold, noise, and various kinds of radiations. Research groups who study occupational cancer are a recent development at a few of the centers. Their studies, carried on by biologists, physical scientists, pathologists, clinicians, and epidemiologists are impressive examples of the multidirectional approach to the solution of a subtle problem in industrial health.

OCCUPATIONAL medicine makes use of a kind of physiology which is not to be found in the medical school curricula or in the basic science review courses in the usual residency training programs. This subject, referred to here as environmental physiology, concerns itself with man's capacity to perform and to endure under conditions of stress. Research in this field is usually carried on with human volunteers rather than with animals, and seeks to define the limits of tolerance rather than to establish backgrounds against which to make diagnoses of disease. Shown here is an experiment in the controlled environment chamber at the University of Pittsburgh, which is part of a study to discover the nature of the response of the peripheral circulation to changes in the effective room temperature and the relationship of this response to increasing age of the individual. The study is expected to contribute to a method of measuring the physiologic age from which may be predicted the capacity of the worker to perform, a consideration which for the industrial physician may be equal to, if not more important than, a determination of the kind of disease present. The active programs of research at most of the institutes provide assurance that this kind of physiology will receive continued emphasis in the courses of training. The industrial physician of the future may be expected to change his methods of work as programs of preventive medicine become generally effective, and ultimately to become more a practicing physiologist as well as a clinician.

Research—A Prototype:

New York University

Institute of Industrial Medicine

THE Institute of Industrial Medicine of the New York University-Bellevue Medical Center has three major functions: research, direct service to industry, and teaching. From its start five years ago the Institute has grown to its present staff of 35. Its administration office and laboratories are at 325 East 38th St., New York.

The teaching program includes a variety of courses ranging from instruction of medical students in industrial medicine to full-time graduate programs. The need for cooperative efforts of industrial hygienists and physicians is emphasized throughout. A number of intensive short courses are arranged to benefit those in allied fields of occupational health as well as the specialist. These have included such courses as Industrial Dermatoses, Radiological Safety, Compensation Medicine, Industrial Medicine for Nurses, and Pulmonary Diseases in Relation to Industry.

A considerable part of the research work of the Institute is undertaken at the request of industry as a direct service. This includes diagnostic studies, medical and industrial hygiene surveys, and toxicological investigation of industrial materials. The work shown below includes projects undertaken for a number of industries. Equally important research activities are the fundamental studies carried out to improve basic understanding of a number of urgent problems in occupational health. These studies, especially, contain the promise of benefits broadly useful to all industry. Some of these activities are:

How Do Chemicals Sensitize Skin?

Basic research supported by Standard Oil Company (New Jersey) and the Public Health Service seeks a fundamental understanding of dermatitis, a major industrial problem. A better appreciation of how and why these disorders develop is required for improvement in methods of prevention and treatment.

Left above: Chromatography discloses the reactions of sensitizers with the amino acids of skin proteins.

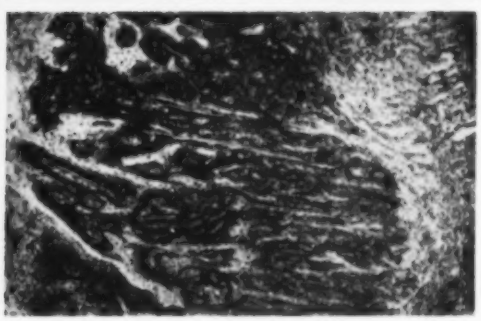
Right above: Chemicals labelled with radioactive tracers are used to study skin penetration and reaction.

Left: Quantitative precipitin studies clarify antigen-antibody interactions of sensitizing chemicals.

Right: Importance of molecular shape of chemicals in sensitization is pointed out. These studies have shown that a particular kind of protein combination is necessary for skin sensitization.

How Can Employees Be Protected Against Occupational Skin Cancer?

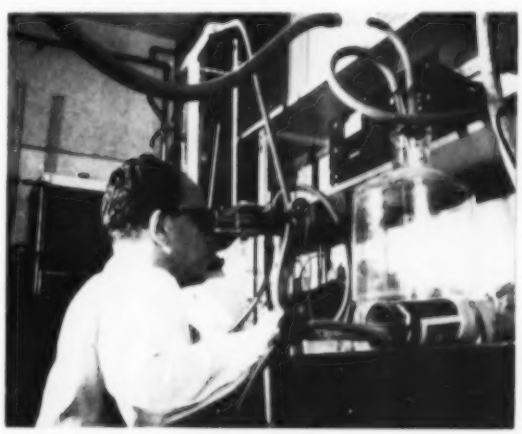
In the Institute's laboratories suspected industrial materials are tested on mice to determine their likelihood of producing skin cancer.



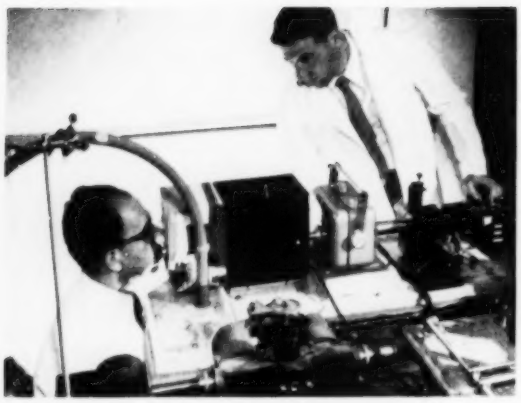
Left above: The material is painted on the shaved back of a mouse. Chronic exposure is simulated by repeated paintings over many months. Right above: The size of the tumor, which appeared after nine months' painting, is recorded at 12 months. Left below: A microscopic section is prepared in the Histology Laboratory to confirm the nature of the tumor. Right below: The tissue section shows the invasive downward growth of the malignant epithelial cells, identifying the lesion as a cancer of the skin.

What Is the Fate of Inhaled Particles of Different Sizes?

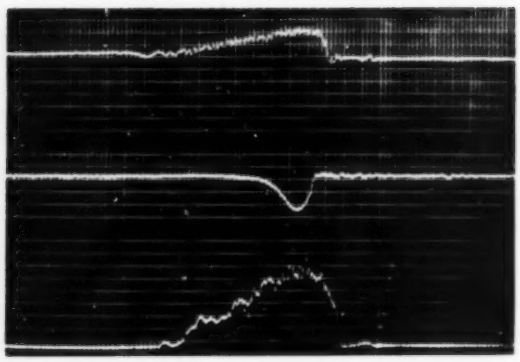
Detailed study of the lung deposition of inhaled dusts and mists is carried out to give a better understanding of occupational dust diseases and poisoning. This work is supported by a grant-in-aid from the Atomic Energy Commission.



Mist particles of uniform size are prepared (background) and measured.



The subject inhales the test mist from the generator and exhales through a device which measures instantaneously the mist remaining in the air from the lungs. The velocity and carbon dioxide concentration of the expired air are measured at the same time.



The string galvanometer photographic record of these measurements shows, at the bottom, air velocity, in the middle, carbon dioxide concentration, and, at the top, the mist concentration exhaled. From these records it is possible to calculate the amount of mist of a particular size deposited in various parts of the respiratory tract.

How Can Safeguards Be Set Up in the Handling of Dangerous Materials?

Toxicity studies aimed at the determination of safe levels of exposure for workers require the use of many laboratory tests.

Right: A spectrophotometer is used to determine blood level of a biological constituent of animals under study. Other diagnostic procedures used include blood counts, and clinical and histological examinations.

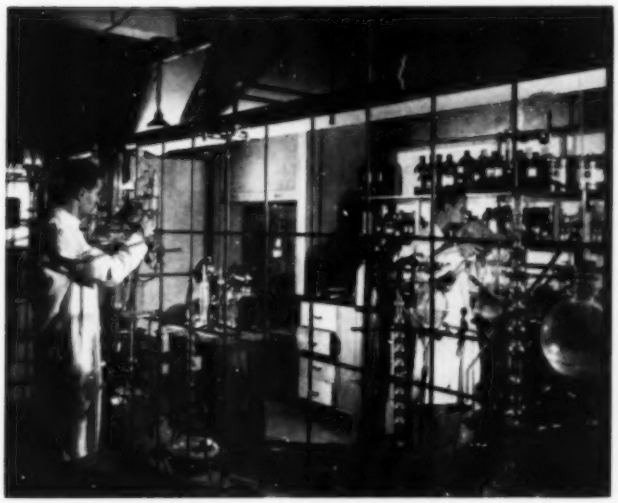
Below, left: Animals are exposed to a gas in a small chamber as a guide to determination of concentrations which may be breathed safely. Bigger chambers are used for the examination of dusts and gases where larger numbers of animals are required.

Below, middle: An animal is weighed before a feeding experiment. Weight change is one of the sensitive indicators of the animal's response to the test material.

Below right: An industrial material is placed under a girdle in contact with the rabbit's skin. This test aids in determining the likelihood of a toxic substance producing poisoning by absorption through the skin. Other tests are used to find out whether materials irritate or sensitize skin.

The Structure of Organic Chemicals

Careful study of the structure of organic chemicals is required for an understanding of their physiological effects.



Left: A view of the organic chemistry laboratory where the structure of materials is studied. Sometimes synthesis of related chemicals is undertaken, further to aid in relating chemical structure to physiological effect. Right: An infrared spectrogram is taken on a compound isolated from a mixture to determine its nature. Many industrial products are mixtures of related materials of which only certain fractions are important from the health standpoint. It is vital to pinpoint the dangerous materials.

Equipment

The Industrial Hygiene Laboratory provides a channel for the application of research knowledge to the control of the industrial environment.

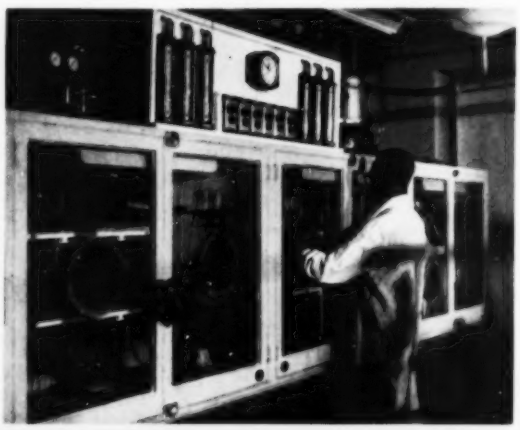
A thermal precipitator for collecting dusts is calibrated. This is one of the many tools used in industrial hygiene surveys of plants.

The various research programs frequently require special equipment which is constructed in the laboratory shop.

Can Lung Cancer Arise From Inhaled Materials?

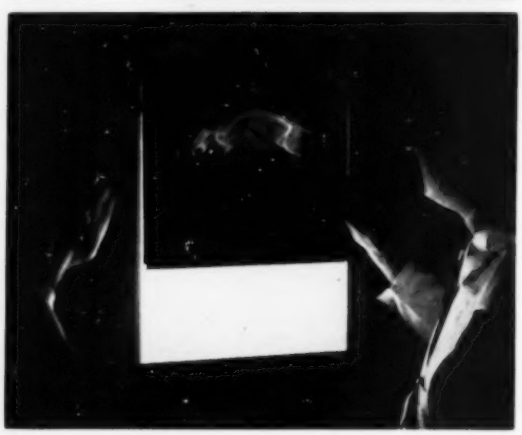
There is now no reliable experimental means of answering this question; a search is being made for adequate procedures. This work proceeds under the support of the Damon Runyon Memorial Fund.

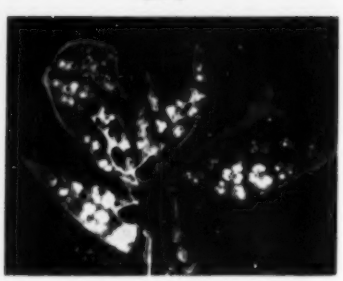
Right:
Special chambers are used for exposing animals to suspected carcinogenic dusts. An isolation unit is shown which includes living quarters for the animals and an exposure chamber; remote handling is used to protect the laboratory worker.



Below, left:
Suspected carcinogens are also injected into the trachea of a mouse.

Below right:
An x-ray of a rat shows a carcinogen-containing pellet implanted in a bronchus. This procedure permits long continued exposure of a well defined area of lung to a test substance.





Far left:
Equipment for ultraviolet photomicrography is used to map distribution of a fluorescent carcinogen.

Above, left:
A section of mouse lung under visible light.

Below, left:
The same section illuminated with ultraviolet light shows the fluorescent particles of the carcinogen in the lung.

Industrial Hygiene Foundation

INDUSTRIAL HYGIENE FOUNDATION at Mellon Institute, Pittsburgh, Pennsylvania, has contributed greatly to the concept that the industrial health program is a management *must*. In the 18 years of its existence it has made its influence felt in hundreds of plants and in almost every type of industry. Workers employed by industry and commerce and their dependents in the United States in 1952 constituted more than 100 million, or approximately two-thirds of the total population. It is not inconceivable that the nation as a whole may have derived benefits from the technical advancement of industrial medicine and hygiene brought about through the Foundation's research, surveys, and allied activities.

The Foundation's Activities

INDUSTRIAL HYGIENE FOUNDATION, Mellon Institute, Pittsburgh, is a non-profit research association. Its purpose is the advancement of occupational health. It is concerned with human resources as well as improvement of working conditions. Its staff includes physicians, chemists, engineers, biochemists, and medical technicians—all specialists in health problems arising in industry. Through affiliation with it, companies and associations are entitled to the services of these specialists, to whom the technical facilities of Mellon Institute are available.

A typical morning mail may bring a request from a member company for plant tests to determine whether existing ventilation is adequately controlling the fume exposure in a specific operation. Another wants help in drawing up plans for construction of a new plant so that engineering controls can be incorporated. Still another needs measurements of the smoke emitted by its stacks. A fourth requests that a thorough audit be made of its medical policies, practices, facilities, and costs.

Special studies made by the Foundation for its member companies have passed the 600 mark. Included are some 400 extensive field surveys, and 60 on specific phases of industrial problems encountered in the plants. In addition the Foundation's specialists in engineering, medicine, chemistry and toxicology have made nearly 150 consultation visits throughout the country. Forty-two basic research studies have been conducted at the Foundation's laboratories, and more than 125 analytical studies have been made. A number of the projects carried out by the Foundation have been on an industry-wide basis, so that many companies not directly involved in the research have benefited from them. Two hundred eighteen companies and associations have taken advantage of the field services offered by the Foundation, many on a plant-wide basis. Many

Management and Medicine—registering for the Foundation's Seventeenth Annual Meeting, at Mellon Institute.

Demonstration of radiant heat transfer and of controls applicable to radiant heat exposures—at one of the Foundation's technical conferences.

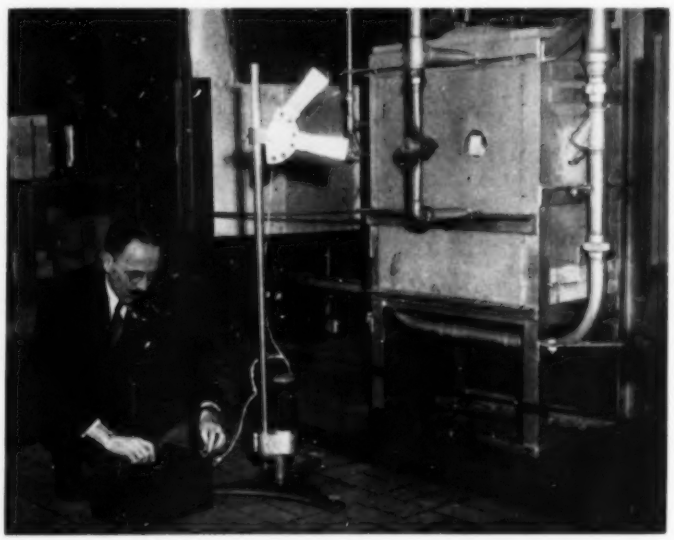
more have presented smaller problems and inquiries by correspondence, and hundreds of requests for literature on industrial hygiene are received each year.

Foundation members represent industries in almost every category, including oil producers, insecticide producers, chemical manufacturers, electric equipment manufacturers, foundries, railroads, metal fabricators, and such other industries as steel, glass, aluminum, sulfur, mining, food processing and ceramics. Surveys have been conducted in all these fields.

The Foundation has grown to its present eminent stature from a small but impressive beginning. The 20 companies which met in 1935 to discuss the creation of such an organization had a serious industrial health problem to solve—the problem of silicosis. They brought this problem to Mellon Institute, and representatives of the Institute met with a handful of physicians, scientists and industrialists in Pittsburgh to discuss the possibility of a scientific research program. The meeting was a closed session at which no minutes were taken, so that each participant would feel free to speak his mind. All were acutely aware of the need for assembling and evaluating available information and conducting research to provide the necessary technical knowledge to solve the problem of silicosis. Out of that meeting the Air Hygiene Foundation was evolved, and a new Fellowship in that name was created at Mellon Institute.

Organization of Mellon Institute

THE Fellowship System is a practical plan for studying long-term industrial problems under the auspices of an educational and scientific institution. It is the fulfillment of the belief of Robert Kennedy Duncan, who early conceived the idea, that industry and science could work in harmonious cooperation for the benefit of our whole country. Dr. Duncan was invited by Andrew W. Mellon and Richard B. Mellon to come to the University of Pittsburgh in 1910 to put his idea into effect and test it on a broad scale. Mellon Institute was founded in 1913 and its Fellowship System placed on a permanent basis. The first organization of its kind, it is a privately endowed non-profit institution, incorporated in 1927 under the laws of the Commonwealth of Pennsylvania, for long-range researches in the pure and applied natural sciences. Its activities have been largely in the fields of chemistry, physics, the engineering sciences and technologies, with ever-increasing emphasis on their application to the important problems of human welfare. Thus public health, sanitation, stream



Directional radiometer for locating radiant heat sources and for measuring the relative intensity of each.

pollution control, smoke abatement, the alleviation of industrial hazards, and improvements in a great number of processes and products which will ultimately benefit everyone are the projects in which Mellon Institute's scientists are engaged. In the past, research programs of the Institute have led to many new and better products and to many new branches of manufacture.

The Institute's library, auditorium and conference rooms, although not open to the public generally, are made freely available on request to scientists and technologists. Many professional organizations of the Pittsburgh district hold their regular meetings at Mellon Institute, and it has served as the convention headquarters of a large number of national scientific societies and allied associations. In a very real sense it has become both a national and a local science-center.

How Mellon Institute Operates

WITH responsibility for the Institute's operating principles and policies vested in a Board of Trustees, its over-all activities are under the supervision of Dr. E. R. Weidlein, President of the Institute, who is assisted by an administrative staff of six Directors of Research and associated department heads.

Mellon Institute operates by means of contracts with Fellowship Donors for specific periods of time, which are required to be of at least one year's duration, with the full-time services of at least one scientist on each Fellowship. Only problems of fundamental importance or of real significance to science and industry are accepted for study. A manufacturer, seeking to investigate a major problem or hoping for general benefit from a planned scientific research program, may execute a contract with the Institute, provided that the proposed field of investigation is one in which the application of the natural sciences —particularly the chemical sciences—offers hope of success, and also provided the field is one not already under investigation in the Institute. Only one research project or Fellowship in any given field is operated at a time; hence there is no conflict between Donor interests within the Institute, and cooperative association among the individual research specialists is encouraged at all times. All results of the research of a Fellowship are the property of its Donor.

Administrative supervision of Fellowships is carried on by the members of the Executive Staff. Each of these men is a specialist in some aspect of the over-all investigational work, and each is responsible for the progress of a group of independent Fellowships. The members of the Executive Staff advise the Fellowship Heads and coordinate the activities of the Fellowships. Close relationships between the Donors and the Scientists on the Fellowships they sponsor have always been encouraged. Many of the Institute's Fellows have gone into the employ of their Donor companies upon completion of their researches. Indeed many leaders in American science and industry began their careers at Mellon Institute; their influence and understanding of the Fellowship System are major factors that continue to contribute to the success of the Institute.

Growth of the Foundation

SINCE its establishment Industrial Hygiene Foundation has operated through its staff on a multiple fellowship basis. The young organization was helped immeasurably by Dr. Edward R. Weidlein, President of Mellon Institute. His deep, personal interest in the activities of the Foundation has been a major factor in the attainment of its present outstanding position. Dr. Weidlein has an intimate relationship with the Industrial Fellowship System since its foundation in 1907, when he was an undergraduate at the University of Kansas. He has been enthusiastically interested in all matters pertaining to the betterment of human relations and working environments. Since 1916 he has been a leader in advancing urban smoke controls and all movements requiring scientific guidance that have for their aim the promotion of the health and well-being of the people.

If the Foundation seems to have attained maturity in a remarkably short period of time, much of the credit belongs to Dr. William A. Hamor, Director of Research at Mellon Institute, who has been its Adviser from the beginning. A pioneer in the field of industrial hygiene, he has made unlimited contributions of his time, energy and experience to the progress of the Foundation. Dr. Hamor's interest in all aspects of industrial health and of human resources began with his studies of the toxic properties of shale oil in the early 1900's. He is an outstanding specialist in industrial research and management and in professional and public relations activities of technical organizations.

With the encouragement and support of such leaders, it was natural that the Air Hygiene Foundation should have gone on from its first research problem on silicosis to such problems as sulfur dioxide and smoke in the combustion of anthracite and bituminous coal.

By 1941 the scope of the Foundation's activities had expanded to other phases of environmental control, and its name was changed to Industrial Hygiene Foundation. With each extension of research the membership increased, until today there are approximately 360 outstanding companies and associations in the United States who have affiliated. There is no other organization quite like it. The unique experiment initiated by the original group of unrelated in-

dustries of working together to achieve optimum industrial health has proved its value. While most of the work the Foundation does for individual companies is confidential, particularly operational procedures, much of its work concerns health practices and is fundamental in nature and therefore can be made available generally. Thus the Foundation can act as a clearing house for assembling and disseminating information, through both the accumulative experience of its able staff and the exchange of ideas of its member companies through the medium of the annual meeting and conferences. The Foundation provides a unifying force behind this endeavor in which management, labor, and the health professions join to bring progress in achieving healthful working conditions on a par with technical and scientific developments.

Annual Meeting and Conferences

EACH year at its annual meeting the Foundation brings together more than 600 top executives, physicians, attorneys, and industrial health specialists whose united efforts are developing ways of improving industrial health and human resources. A wealth of information is informally exchanged at the technical conferences by representatives from member companies on medicine, engineering, chemistry and toxicology, and the legal aspects of industrial health. Special sessions are held on selected subjects or for discussion of common problems in industrial groups.

Publications

TO KEEP the public and its membership informed, the Foundation issues a number of publications, including the monthly *Industrial Hygiene Digest*, which is sent to nearly 2,000 persons designated by the member companies. Technical papers by staff members and transactions of the annual meetings and conferences are also distributed. Nearly 300 such publications have been released to date.

How It Serves

THE FOUNDATION gives direct professional assistance to member companies in the study of industrial health problems and their solution; it assists companies in the development of health programs as an essential part of industrial organization; and it contributes to the technical advancement of industrial medicine and hygiene, through research, surveys and allied activities.

Typical of these services is a recently completed industrial hygiene survey. While excellent progress had already been made in providing a good working environment and protecting the health of the worker, the officials of the company envisioned additional benefits to be derived from a permanent full-fledged industrial hygiene department. Industrial Hygiene Foundation was asked to lay the groundwork for broadening and enhancing the scope of the industrial hygiene activities to provide even better working conditions. A study was made of the working environment, which furnished an inventory of nuisance exposures and potential hazards. Evaluations were made on the basis of observations, and information on operational procedures and representative data were obtained by measurement of chemical and physical environmental factors. Results of the study are important from the short-term veiwpoint, but more significantly they have a fundamental value in providing a foundation on which the company is building a continuing and permanent program of environmental and medical study and evaluation.

Training Program

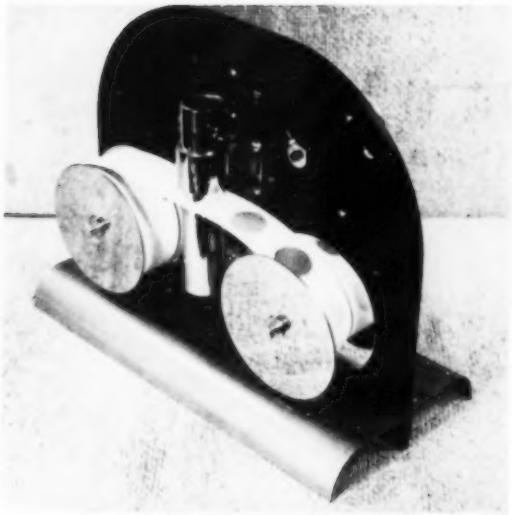
TRAINING of young men in specific fields of industrial hygiene is a service that is offered by the Foundation to all of its members. By working with the Foundation staff at its headquarters at Mellon Institute the trainee gains practical experience. Didactic training, through seminars, lectures and planned reading programs, supplements the research work. The trainee is encouraged to maintain liaison with the Foundation after completion of the training program. A similar valuable service is frequently utilized by a company to greatest benefit at the time the Foundation is conducting a field survey by selecting a company man to work with the Foundation staff. This man can then work towards a continuing maintenance program.

Air Pollution Studies

AIR pollution investigations being sponsored for the fourth consecutive year by the American Iron and Steel Institute include a trainee program. Fourteen trainees have participated in the program to date. The men contribute to the research work and at the same time are indoctrinated with an understanding of the nature of the air pollution problem. The research has included studies on the chemistry of sulfur dioxide oxidation, the development of low-cost instruments for the measurement of air pollution intensity at ground level, and a project on the kinetic behavior of particulate matter in stack gases, in relation to the problem of measuring dust in such gases, that will ultimately embrace the performance of dust-and-fume collection equipment.

Instruments designed and constructed by the Foundation's engineering staff in connection with the air pollution studies for the American Iron and Steel Institute have made possible simpler and more reliable methods of air pollution sampling techniques.

The I.S.I. Automatic Smoke Sampler has al-



Automatic smoke filter instrument.

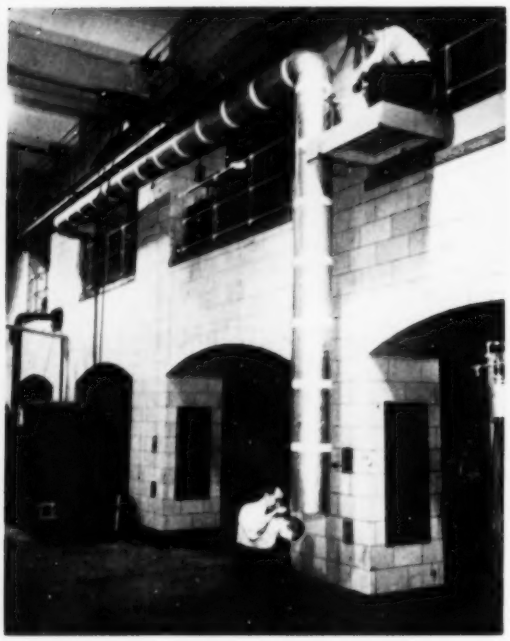
Hydrogen sulfide sampler

ready received broad acceptance, and is being produced commercially by a Pittsburgh firm. Its potential value is in a study of smoke or haze concentrations in any area for correlation with wind direction and other weather factors so that relative contribution of various sources can be established. The instrument measures the fine particles of dust which have a soiling effect on walls. It can be used to provide an historical record of the intensity of coal smoke or haze over long periods or it can be applied to the measurement of some particular pollutant compound. The instrument's low cost makes it feasible to cover an area in considerable detail by the placement of a large number of individual instruments, and its freedom from noise makes it acceptable to residents.

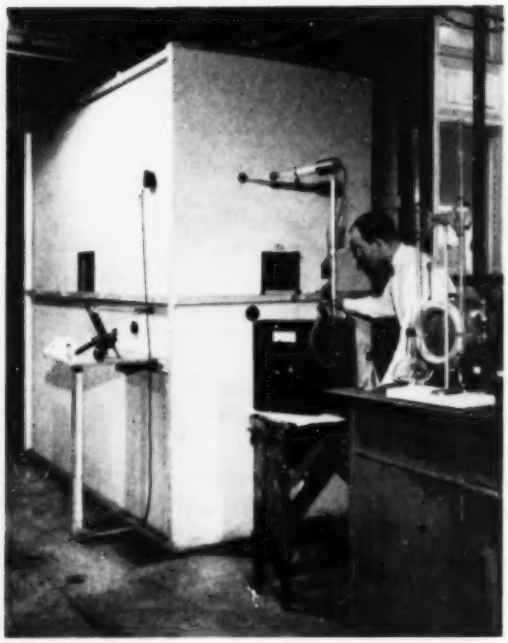
The hydrogen sulfide sampler devised under the same program is an adaptation of the automatic smoke sampler. Used to measure the hour-

Dust analysis equipment, to measure the number of dust particles in air samples from an industrial plant.

Comparisons of records reveal that blackness in the air is generally affected by weather.



Pilot plant for stack dust sampling studies.



Oxidation of sulfur dioxide studied in smog chamber.

ly changes in the atmosphere of hydrogen sulfide, which is the air pollutant responsible for the tarnishing of silverware and the blackening of house paints containing lead pigments, it employs the automatic smoke sampler but incorporates provision for the removal of the black solids prevalent in ordinary air from the air sampler by efficient filtration while permitting passage of the hydrogen sulfide gas. It requires preparation of an impregnated filter paper tape so that some intense color change would occur that is proportional to the power of the gas content to blacken certain surfaces, e.g., lead house paints and silverware. Tests in one area revealed that there is a sharp increase in concentrations of hydrogen sulfide in the air around midnight.

Outstanding among other air pollution investigations made by the Foundation is a year-long intensive survey of air pollution in New Haven, Connecticut. The objective of this investigation was to determine the extent and nature of the air pollution problem in New Haven in order to have a factual basis for the enactment of air pollution control legislation, if warranted. All aspects of air pollution throughout the metropolitan area were studied.

One company, concerned about potential contaminants that might pollute the community in which a new plant was being built, requested that a survey be made before construction was started in order to provide a base line with which to compare measurements taken after the plant was in operation. Going one step further, the company developed a method of virtually eliminating the effluents at the point of discharge.

Plant-Wide Surveys

AIR pollution research is only one of the industrial health fields in which the Foundation is prominent. Constant changes occurring in nature of materials and methods of processing bring up new industrial hygiene problems. Medical audits and environmental surveys are often required. Two such comprehensive studies were recently undertaken for large oil corporations. For the one a comprehensive and detailed survey of medical policies and practices was made. A representative number of subdivisions in each of the major departments were visited and inspected, and many individuals in all areas relating to medical service were interviewed. A careful evaluation was made of the facilities for treatment of injuries as well as the preventive aspects of the medical program. The preplacement and periodical physical examination methods were studied and the extent of medical care to the employees was analyzed.

For the other company an environmental study was made involving surveys of refineries for the purpose of general appraisal of environmental factors that might affect the health of employees in those plants. Six refineries representative of all the principal manufacturing operations under a range of climatic conditions were selected for study. Since the basic health problems of the

Dust classifier for separating dust particles into size fractions.

industry arise from the raw materials that are processed, the methods of manufacture, and the final products derived therefrom, the refineries selected for study constituted a cross-section of the widespread activities and covered a diversity of operations. The findings and conclusions were then given company-wide distribution.

The Foundation is aware that in addition to a complete and effective environmental hygiene program it is necessary to have an understanding of the man and his relation to the tools with which he works, the materials upon which he works, and the physical and chemical properties of the working environment.

Radiant Heat Reduced

THE need for an understanding of the way in which man responds to environmental stress was particularly evident in a study undertaken by the Foundation of the heat exposures in glass manufacture. It had been the practice in this industry to reduce heat exposures by means of ventilation and "man-cooling" fans. The Foundation's studies revealed, however, that, a major fraction of the heat load imposed on the worker is often in the form of radiant heat which cannot be reduced materially by ventilation. There is an exchange of radiant heat between hot and relatively colder surfaces which is independent of the temperature of the intervening air. The only way radiant heat can be suppressed is by lowering the surface temperature of the hot surface or by interposing a suitable screen between such surfaces and nearby workmen. The outstanding practical screening device is aluminum, although other types of screens may be used in special circumstances. By means of radiation screening it was demonstrated that the heat load on workers in glass factories could be reduced by as much as 75% without any change in the ventilation system. In recognition of the great contribution made by radiant heat in the hot industries which this study demonstrated, considerable progress has since been made to improve the working conditions in a number of plants in the glass industry and in others where hot processes are encountered.

Ventilation Control

PROTECTIVE measures were the goal of a western mining company which requested an appraisal of production activities, particularly the smelting and refining of the metal. The Foundation assisted the company in designing appropriate ventilation and control measures to prevent the dissemination of harmful or objectionable amounts of contaminants into the breathing zone of the workers. These control measures resulted in definite improvement of the working environment.

Toxicological Laboratory

NOT ALL the extensive research for the Foundation's member companies is done in the field. Projects of great magnitude are carried on at the Foundation's laboratories. Typical is a study precipitated by the troubles lamp manufacturers were experiencing with the use of beryllium in fluorescent lighting. Although beryllium was previously thought to have a low order of toxicity,

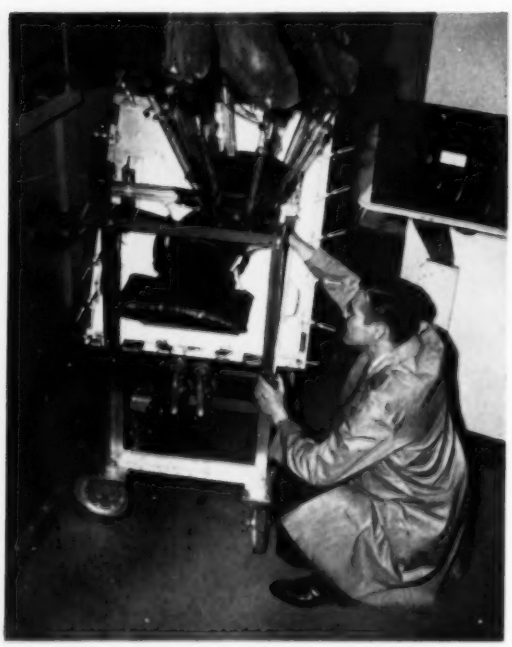
The kinetic behavior of dust in stack gases is being studied at this site near Mellon Institute.

certain serious reactions that no one had anticipated showed up after the fluorescent lights were on the market. Immediate steps were taken to develop other phosphors which did not contain beryllium. The new phosphors were investigated by the Foundation at the request of the lamp manufacturers. Toxicological testing over a period of more than two years failed to reveal any ill effects to animals even when exposure was to quantities far in excess of practical industrial exposures. It was concluded that these phosphors possess no serious toxic properties, and the manufacturers were able to proceed with confidence to produce the new fluorescent lamps.

Another investigation recently completed by the toxicology laboratory personnel dealt with the nature and extent of possible eye irritating effects of a number of formulations. Others pertained to the chloracne-producing potential of various chlorinated organic compounds. Projects relating to the effects of several inorganic dusts and to the chronic toxicity of specific organic compounds are also under way.

Iron Lung Adapted for Research

INVALUABLE in hundreds of tests made at the toxicology laboratory is the iron lung which was lent to the Foundation in 1947 by the Warren Collins Company. The mechanism, bearing serial No. 3, is probably a museum piece in that the first two manufactured by the company cannot be located. The only older models are the original ones designed by Professor Philip Drinker. Intended for therapeutic purposes, the iron lung has been admirably adapted to research work. In such studies as determination of dust retention in the lungs the respirator has been used to control the frequency and depth of breathing of the test subject and to actuate a mechanical partitioning valve on the breathing mask which separates every exhalation into seven separate fractions. The first fraction of the exhaled air comes from the nasal chamber and the last fraction from the deepest part of the lungs. Differences in the amounts of dust contained in the several fractions reflect the differences in the degree of dust retention in the different parts of the respiratory system.



"Iron lung" respirator controls breathing of subject and permits fractional sampling of expired air.

Reversing the usual order of research procedure, the Foundation first used human subjects and then animals. Making use of exactly the same plan as employed in the human respirator, the staff constructed miniature respirators for use with experimental animals.

Noise Research Program

THE STUDY of noise was added to the Foundation's fields of research this year. Recognizing that much uncoordinated research was being carried on in conjunction with the problem of noise, its measurement, and its physiologic effects, representatives of interested groups asked the Foundation to act as a coordinating agency for a broad program of action. The similarity of this problem to those involving contaminants made the Foundation the ideal center for such work. Within its framework are the facilities for integrating research involving the closely related medical, engineering and legal problems. Its close relationship with the University of Pittsburgh and Carnegie Institute of Technology makes available consultation with acousticians, physicists, and other specialists.

The Staff

THE present staff of Industrial Hygiene Foundation, headed by Dr. C. Richard Walmer, Managing Director, includes: Dr. H. H. Schrenk, Research Director; Mr. W. C. L. Hemeon, Engineering Director; Dr. Daniel C. Braun, Medical Director; Mr. Theodore F. Hatch, Research Adviser; and other scientists. Each is a specialist in particular phases of industrial health, and Foundation members have the benefit of the collective and accumulative knowledge concentrated in this capable group. The staff is supported by a Board of Trustees, of which Mr. Andrew Fletcher, President of St. Joseph Lead Company, is Chairman; by a Research Advisory Council; and by Medical, Legal, Chemical and Toxicological, Preventive Engineering and Air Pollution Control Committees.

Conference Board of Physicians

In Industrial Practice

FOUNDED April 4, 1914, the Conference Board of Physicians in Industrial Practice pioneered in the field of Industrial Medicine and Hygiene. This group was among the first to realize that man, the most complicated machine of all, was undoubtedly the most neglected asset of the nation's industries. When the National Industrial Conference Board was established in 1916, the Conference Board of Physicians assumed the role of adviser to this young and growing business research organization and continued to serve in that capacity until 1937. From that point the National Industrial Conference Board has carried on, and continues to concern itself with deep and untiring interest in the field of Industrial Medicine and Hygiene.

NICB's interest in this field has reflected itself in many ways, with a Senior Research Specialist continuously assigned full-time to the subject. As part of its regular conference activities the Board has continued panel discussions of pertinent topics in the field of industrial medicine, inviting prominent speakers to discuss their findings and research concerning such topics as executive health programs and various matters pertaining to employee health and hygiene. A course on medical and health plans has been included as part of the curriculum of the Conference Board's Personnel Courses conducted semi-annually as a training course for personnel executives of Associates. Information is offered by the Board as a regular service to Associates desiring to institute medical and health programs in their companies or desiring data on other developments in the field of industrial medicine. NICB's monthly magazine, *The Management Record*, read by thousands of leaders of management and labor, publishes a continuing flow of material concerning many aspects of industrial medicine. Such topics as: "A Streamlined Medical Clinic," "Management and the Industrial Nurse," "A Health Center for Hotel Employees," "The Community Doctor Visits Industry," "Industry Studies Sound Effects," "Cancer Detection Program Continues," "Health Programs for the Executive," and "Getting Executives to Visit the Doctor," have appeared recently, while others are constantly being prepared. Major research reports covering a variety of subjects in industrial medicine are written and published by the Conference Board. Among more recent of these are: "Cooperative Medical Programs—A New Solution for Small Companies" (Studies in Personnel Policy, No. 134); "Company Medical and Health Programs" (Studies in Personnel Policy, No. 96); and "Employment of Handicapped Persons" (Studies in Personnel Policy, No. 63). Today the Conference Board is in the habit of inviting the assistance of consulting physicians on a policy level as an aid and guide to the research activities of the Board's Division of Personnel Administration, thereby insuring that this important part of the industrial scene is given careful consideration.

WHEN the Conference Board of Physicians in Industrial Practice was founded, it set forth the following statement of purpose: "The Conference Board of Physicians in Industrial Practice is organized for cooperative effort in introducing into industrial establishments the most effective measures for the treatment of injuries or ailments of employees; for promoting sanitary conditions in workshops; and for prevention of industrial diseases." Throughout its history this remained the goal.

At first only a relatively small number of physicians of corporations were brought together so as to facilitate their work and give their discussions a more intimate character.

Dr. John J. Moorhead, of New York City, then the Chief Medical Officer of the Interborough Rapid Transit Company and the New York Railways Company, was the first Chairman of the Conference Board of Physicians, and M. W. Alexander, then of the General Electric Company, West Lynn, Massachusetts, was Executive Secretary. Present at early meetings were:

DR. T. JOHN BOWES, Philadelphia Electric Company, Philadelphia.

DR. C. C. BURLINGAME, Cheney Brothers, South Manchester, Connecticut.

DR. W. IRVING CLARK, Norton Company, Worcester, Massachusetts.

DR. ROYAL S. COPELAND, Consolidated Gas Company, New York City.

DR. G. M. DORRANCE, Joseph Campbell Company, Camden, New Jersey.

DR. E. H. HANNA, Cadillac Motor Car Company, Detroit.

DR. G. L. HOWE, Eastman Kodak Company, Rochester, New York.

DR. W. G. HUDSON, E. I. du Pont de Nemours Powder Company, Wilmington, Delaware.

DR. J. A. JACKSON, New York Edison Company, New York City.

DR. CHAS. A. LAUFFER, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania.

DR. FREDERICK W. LOUGHRAN, Medical Adviser, State Insurance Fund, New York City.

DR. DON B. LOWE, B. F. Goodrich Company, Akron, Ohio.

DR. JOHN W. LUTHER, New Jersey Zinc Company, Palmerton, Pennsylvania.

DR. A. C. MARSHALL, Powers-Weightman-Rosengarten Company, Philadelphia.

DR. J. D. MCGOWAN, Commonwealth Edison Company, Chicago.

DR. JOHN J. MOORHEAD, Interborough Rapid Transit Company, and New York Railways Company, New York City.

DR. FRANCIS D. PATTERSON, Harrison Brothers & Company, Inc., J. G. Brill Company, Electric Battery Company, Philadelphia.

DR. W. E. RAMSAY, American Smelting & Refining Company, Raritan Copper Works, Barbor Asphalt Paving Company, Perth Amboy, New Jersey.

DR. L. M. RYAN, Hudson & Manhattan Railroad Company, Foundation Company of New York, New York City.

DR. F. E. SCHUBMEHL, General Electric Company, West Lynn, Massachusetts.

DR. LOYAL A. SHOUDY, Bethlehem Steel Company, Bethlehem, Pennsylvania.

DR. JOHN WOODMAN, New York Edison Company.

DR. RANDALL ZIMMERMAN, Westinghouse Air Brake Company, Wilmerding, Pennsylvania.

THESE early members represented corporations which at that time employed over 250,000 men and women in both the skilled and unskilled categories. By the year 1921 the members of the group had grown to a point where they represented over half a million men and women employed by industry. The organization had first met in small groups where basic problems confronting medicine in industry were discussed and papers presented. Early projects completed by this group were: "Instructions to Laymen for First Aid Treatment of Common Injuries and Disorders," a standardized "Physical Examination Record Card," a set of "Health Hints" for employees, and requirements for a "Standardized First Aid Treatment Room." (It is believed that the Conference Board designed the first standard first aid kit for business firms.) As time went on the projects undertaken became of a more complex nature, and the group then endeavored to establish a standardization of medical terms used by industrial physicians. It also entered into a careful study of diseases peculiar to certain occupations, with a view to learning the most effective treatment of such diseases and the best method of reducing or entirely eliminating their causes. It was not until March, 1916, however, that the Conference Board of Physicians issued its first report, "The Physician in Industry." This was written by Magnus W. Alexander. Shortly before this time the author of this first report had been elected President of the newly formed National Industrial Conference Board, a capacity in which he continued until his death in 1932. This first report was followed by a series of research reports:

"Health Service in Industry" (Research Report No. 34, January, 1921)

"The Physician in Industry" (Special Report No. 22, June, 1922)

"The Relation of Medicine to Industry" (Special Report, No. 30, October, 1924)

"Medical Care of Industrial Workers" (Research Report No. 114, April, 1926)

"Medical Supervision and Service in Industry" (Research Report No. 180, December, 1931).

It might be noted at this point that approximately a third of the 34 initial reports issued by the National Industrial Conference Board during the first five years after its inception were concerned with industrial medicine and were written with the cooperation of the Conference Board of Physicians.

Typical of these reports are:

"Workmen's Compensation Acts in the United States—The Legal" (Research Report No. 1, April, 1917).

"Analysis of British Wartime Reports on Hours of Work as Related to Output and Fatigue" (Research Report No. 2, November, 1917).

"Hours of Work as Related to Output and Health of Workers" (Research Report No. 4, March, 1918).

"Sickness Insurance or Sickness Prevention?" (Research Report No. 6, May, 1918).

SENSING the coming importance of the role of medicine in industry, the first President of the National Industrial Conference Board in the first report issued by the Conference Board of Physicians predicted that "the physician has come into industry to stay." Of course, this prediction has now become *fact*. From this humble beginning industrial medicine has become a recognized and important field of medical practice, with departments being established in medical colleges across the nation. Since its inception, the National Industrial Conference Board has realized and stressed the importance of industrial medicine, and today, in keeping with its role as the research and educational center of American business, is carrying on the work of the original Conference Board of Physicians in Industrial Practice, borrowing from this original group many of the methods which were found to be so successful in plotting the course of research in industrial medicine.

Periodicals

DURING the period embraced by this Anniversary Issue, few medical publications throughout the land have failed to publish numerous articles bearing upon occupational health. For this, the gratitude of all industrial physicians. However, this section is limited to those publications exclusively or foremostly dedicated to industrial medicine and industrial hygiene. No single publication has endured throughout this period without some modification in title. This represents no defection and instead usually reflects the better consolidation of the field of intended coverage.

The periodicals of the period are:

Journal of Industrial Hygiene: Boston, 1919. This ran through 19 volumes to 1937.

Journal of Industrial Hygiene and Toxicology: Boston. The same as the preceding journal continued through volume 31, 1949.

Occupational Medicine: Chicago. Founded in 1946, this continued through volume 5 to 1948.

Archives of Industrial Hygiene and Occupational Medicine: Chicago. Volume 1, No. 1 appeared in January, 1950. During the period of the second volume, the name was changed to *A.M.A. Archives of Industrial Hygiene and Occupational Medicine.* This continues to the present time, volume 7 being current.

Industrial Medicine: Chicago. Volume 1, No. 1 appeared in October, 1932. This designation continued into volume 18, then became *Industrial Medicine and Surgery* and is currently in volume 22.

Foundation Facts: A publication of the then Air Hygiene Foundation, Pittsburgh, with first appearance in 1939. Both the name of the Foundation and its publication were altered, respectively, to Industrial Hygiene Foundation and *Industrial Hygiene Digest.* That publication is now in volume 17. Foremostly it is dedicated to abstracts of industrial hygiene literature.

Industrial Hygiene Newsletter: Washington. United States Public Health publication established in 1940.

Industrial Health Monthly: Washington, 1951. This was a continuation of the *Industrial Hygiene Newsletter.*

Occupational Health: Washington, 1952. This was a continuation of the *Industrial Health Monthly* which in turn was a continuation of the *Industrial Hygiene Newsletter.* This is now a part of *Public Health Reports.*

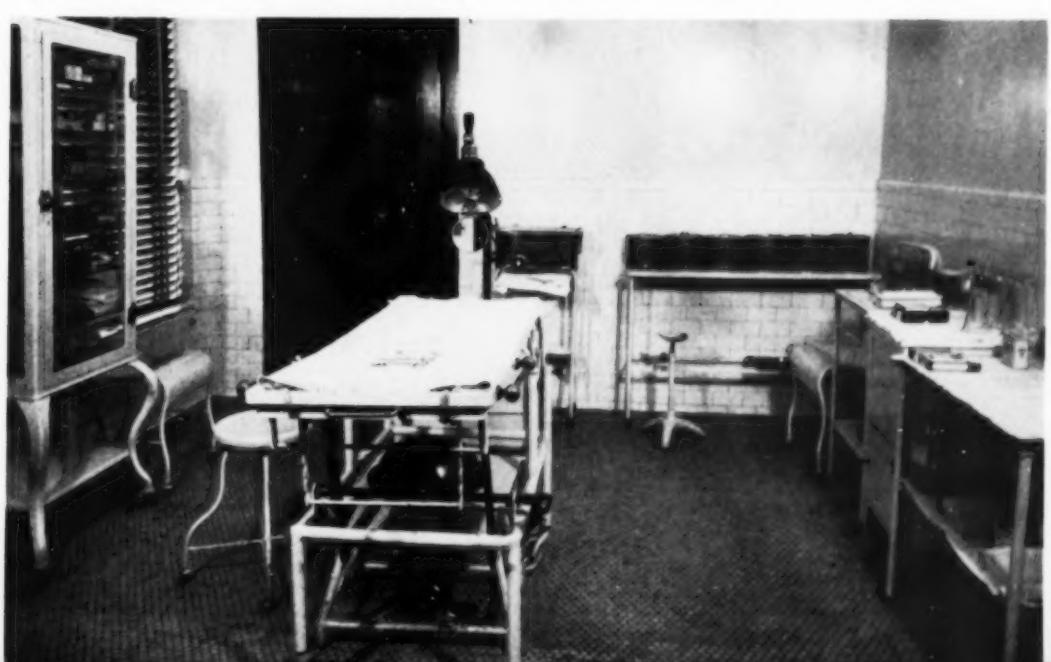
Occupational Hazards: Cleveland, 1938. A nontechnical monthly publication devoted to both safety and occupational health, now in the 15th volume.

Monthly Review: New York State Department of Labor, Division of Industrial Hygiene and Safety Standards, New York City. Formerly *Industrial Hygiene Bulletin Monthly,* reprinted from *Industrial Bulletin* now in volume 32.

American Industrial Hygiene Association Quarterly: Chicago. Official organ of the American Industrial Hygiene Association, now in volume 14.

Occupational Health Bulletin: Ottawa. Formerly *Industrial Health Bulletin.* This is the governmental publication for the Canadian Department of National Health and Welfare, Industrial Health Division. This monthly is now in volume 8.

THE furtherance of occupational health has been served by constructive contributions printed in the *Journal of the American Medical Association, American Journal of Public Health, National Safety News,* divers organs of the United States Public Health Service, and from several of the Industrial Hygiene Divisions of State Health and Labor Departments.



The Appointment Staff

Union Health Center

International Ladies' Garment Workers' Union

THE UNION HEALTH CENTER, pioneer in the field of union-sponsored health plans, had its origin in the effort to improve the sweatshop conditions existing 45 years ago in the ladies garment industry in New York City. It represents the determination of workers in an industry to solve their own health problems through their own cooperative efforts.

Women's clothing in the early 1900's was manufactured in unsanitary workrooms where light, ventilation and cleanliness were disregarded, or in the tenement homes of the workers themselves. They often toiled as much as 70 to 80 hours a week, including Saturdays and Sundays, for a mere pittance. Poverty, and its attendant, poor health, were prevalent.

Conditions such as these led to the strikes of 1910 and 1911, when the International Ladies Garment Workers' Union made its first successful attempt to set up decent wage standards and working conditions. Representative public citizens and a number of fair-minded employers joined with the union in setting up a Joint Board of Sanitary Control to establish a code of sanitary standards.

However, the improvement of working conditions did not automatically improve the health of the workers. A medical survey conducted in 1913 uncovered a multitude of chronic conditions in the members which required attention. They constituted a low-income group, the individual members of which could not pay for the medical service they required. The leaders of the union, seeking a practical way of obtaining high quality medical care for their members which would, nevertheless, still be within their means, adopted the compromise of the practice of group medicine supplemented with prepayment sickness insurance.

The incidence of tuberculosis being especially high, the local unions began to establish tuberculosis funds to help those afflicted receive appropriate treatment until the disease was brought under control. Upon the member's return he could work in the industry only if he remained under the supervision of the Sanitary Board.

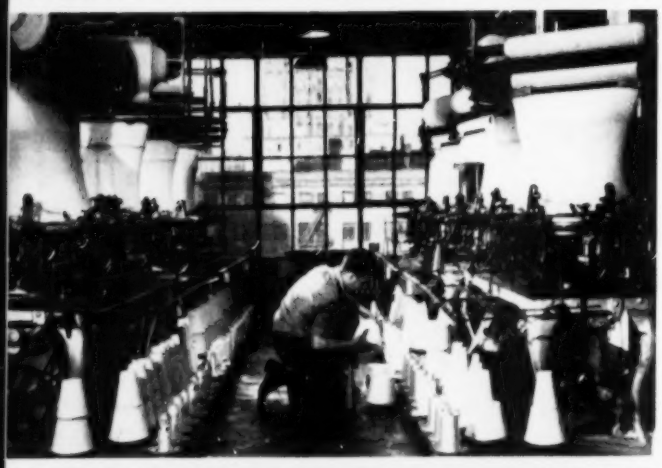
Sick benefits for illness other than tuberculosis were gradually added. In 1913 the Union Health Center was established, which examined new applicants to the union and certified for sick benefit. In 1917 a diagnostic and therapeutic clinic was set up which rendered treatment to members of certain locals.

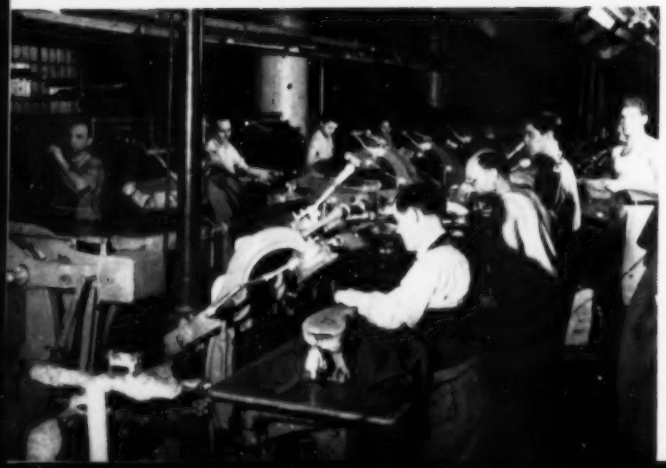
In 1919 seven of the local unions in association, purchased and equipped a four-story building on East 17th Street, the Union Health Center, in which additional medical and diagnostic services were provided on a cooperative and self-paying basis, the union furnishing the premises and the organization, the services being paid for by those receiving them.

From 1913 to 1945 the medical services were paid for almost wholly by the union members on a fee-for-service basis, which was set at a nominal charge of $1.00 for a visit to the doctor, plus a subsidy from union funds. In 1945 the first employer contributions were secured through collective bargaining for health and welfare provisions for union members. Since 1946 most of the medical services provided by the Union Health Center have been paid for by the union's health and welfare fund.

Present Status

THE present policy of the Center is to provide a limited but much needed medical service to the 200,000 members of the Inter-





national Ladies Garment Workers' Union in New York City. There is no attempt to solve the total health problems of ILGWU members. Medical services on an ambulatory basis are furnished, always emphasizing the highest medical standards and the practice of preventive medicine, including those services most important to the maintenance of the health of the workers.

It is estimated that approximately 75% of the health needs of the union members are met by the Center's services. These are supplemented by cash subsidies to help cover the costs of hospitalization, catastrophic illness such as surgery, and prolonged invalidism among older and chronically ill workers. Cash subsidies in themselves may not always be sufficient to cope with such problems. Nevertheless they are of considerable assistance to a working population which wishes to prepay the cost of its medical requirements without recourse to charity. The ILGWU has taken the realistic attitude of utilizing every advantage in the local community service situation to secure adequate medical protection for its members.

Plant and Facilities

PHYSICAL: The activities of the Center are housed in approximately 100,000 square feet, on a total of six separate floors. These are part of its own 27-story building in mid-Manhattan close to the garment district in which its patients work.

Fifty-eight modern examining rooms are available for the medical work, including special suites used for multiple clinics in such services as eye, allergy, chest, heart, gynecology and urology.

The physical therapy department contains 23 rooms equipped to render electrotherapy, heliotherapy and hydrotherapy, in addition to therapeutic exercise.

The x-ray department contains four diagnostic machines, including the latest type available. Both superficial x-ray therapy and deep x-ray therapy are given in this service, which also includes a urological diagnostic unit. Electrocardiography uses direct-writing machines, rendering tracings immediately available for diagnostic purposes.

Basal metabolism rate determinations by the oxygen consumption method were replaced by the radioactive iodine uptake procedure in May, 1953. A lead-shielded laboratory, required whenever radioactive isotopes are used, has been set aside in the x-ray department for this service.

The laboratory has been expanded to provide ample space for all its necessities. The pharmacy dispenses between 500 and 700 prescriptions

daily. The nutrition suite contains a demonstration kitchen, classroom, and office.

A section of the Center is devoted to medical certification of non-occupational disability in union members claiming sickness insurance benefits. A block of examining rooms are used by physicians trained in disability evaluations who examine the claimants. A large glass-walled office provides working space for clerical and administrative personnel who report medical findings and recommendations to the local unions underwriting the insurance.

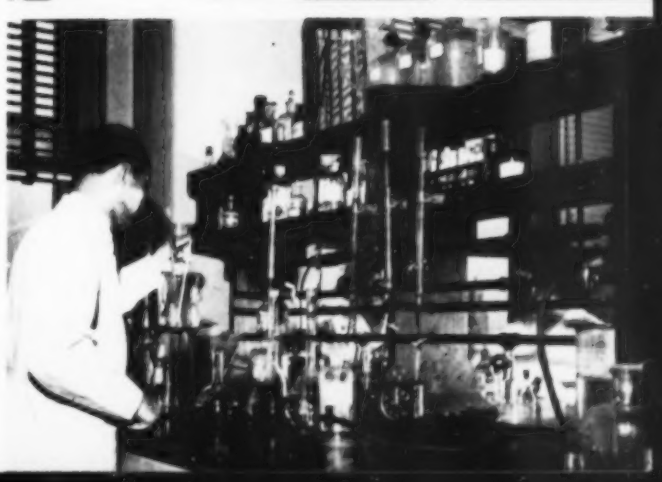
In addition, offices for administrative officers and their secretaries and for the administrative departments such as accounting, statistics and personnel, and for service units such as medical stenography, social service and medical records, are spacious and well equipped.

This central clinic serves the workers in about 8,200 small factories within easy reach of its premises. A central clinic located in an area near the work places of the largest section of the population has proved convenient for most workers and economical and efficient to operate.

THE PHYSICIANS: A total of 176 different physicians man the services of the Center. Most of them serve, and are paid, on an hourly basis. However 10 physicians serve the Center full time, and 15 other physicians give a minimum of 20 hours a week. It is these doctors, known as Administrative Physicians, who share in administrative procedure and supervision. These physicians are oriented to the needs of the patients and the services of the institution and the community. They have the knowledge and background required to solve individual problems requiring continuing attention which the visiting physician does not have the time to give.

The Administrative Physician has the opportunity of discussing a patient's problem with him and his family. He corresponds with hospitals, private physicians, social agencies, and insurance companies concerning the medical history of a given case. He decides whether a patient applying for medical attention should be referred to the general medical or a specialty clinic or some other service. He renders first aid care to emergency cases and arranges hospitalization when it is required. He works with the social service department in helping patients whose needs cannot be met at the Center to find a solution through community agencies. He coordinates the work of the part-time general physicians with that of the part-time specialists.

LAY STAFF: In addition to physicians, the staff at the Center numbers 40 nurses and aides,



30 technicians, five pharmacists, two nutritionists, two social workers, and 125 clerical employees, including registrars, clerks, stenographers, statistical and accounting department workers, telephone operators and others required to handle the myriad details connected with the provision of medical service.

DIRECTION: A committee of union officials, appointed by the president of the union, constitutes the Board of Directors. The institution itself is in charge of a physician, the Director. He is assisted by a Medical Council of eight physicians who have contributed long service to the institution. The Council meets periodically to consider questions of medical policy and advise the Director upon policy matters. A joint Committee of the Board of Directors and the Medical Council meets at intervals for discussions.

Detailed questions of the medical procedures, such as therapeutic trends, changes in the formulary, or new types of laboratory examinations to be done at the institution, are considered by a Medical Board composed of the head of each medical service and three physicians elected by members of the medical staff.

Attendance and Population

ATTENDANCE: After prepaid medical service was inaugurated in 1945 spectacular increases in the demand for medical services took place each year until 1951, when apparently a stabilization point was reached. The initiation of unlimited medical credit for the members in July, 1952, did not result in any noticeable increase in demand for service, the previous annual credit of $30 at subsidized rates apparently having been adequate to meet the average medical need.

The following table shows the different categories of services rendered:

ATTENDANCE FOR MEDICAL SERVICE IN 1952

All examinations	565,878
General medicine	101,739
Medical specialties	145,524
Therapy—physical, injection and x-ray	54,109
Diagnostic (Laboratory, x-ray, BMR, EKG, audiometer)	158,571
Special Services (Medical interviews, biopsies, minor surgery, nutrition, social service)	45,008

THE PATIENT POPULATION: The great majority of the workers in the garment industry are women. However, the Center's patients are almost equally divided between the sexes.

Geriatrics plays an important role in the Center's activities. Workers in some crafts in the trade, such as cutting and pressing, are predominently men in the older age groups. In one local union whose members are 93% men, the average age is over 57 years. The women workers who make the most use of the services of the Center are in the older decades of life.

Union Health Center

International Ladies' Garment Workers' Union

Leo Price, M.D., Director

Total Services

1913–1952

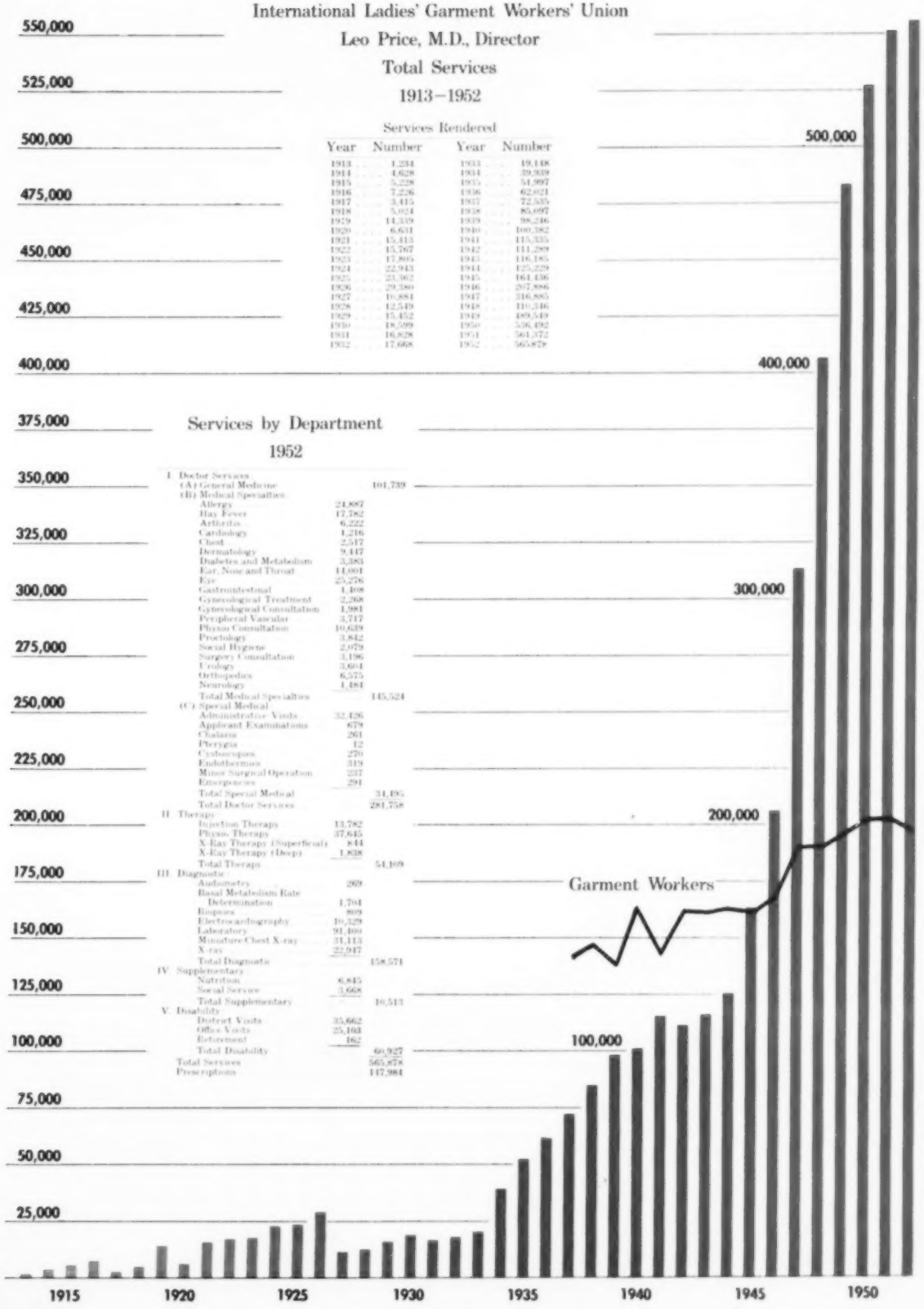
Services Rendered

Year	Number	Year	Number
1913	1,234	1933	19,148
1914	4,628	1934	39,939
1915	5,228	1935	51,997
1916	7,276	1936	62,021
1917	3,415	1937	72,535
1918	5,024	1938	85,697
1919	14,339	1939	98,246
1920	6,631	1940	100,382
1921	15,413	1941	115,335
1922	15,767	1942	111,289
1923	17,895	1943	116,185
1924	22,943	1944	125,229
1925	23,362	1945	164,436
1926	29,380	1946	207,896
1927	16,884	1947	316,885
1928	12,549	1948	410,346
1929	15,452	1949	489,549
1930	18,599	1950	536,492
1931	16,828	1951	561,372
1932	17,668	1952	565,878

Services by Department

1952

I. Doctor Services		
(A) General Medicine		101,739
(B) Medical Specialties		
Allergy	24,887	
Hay Fever	17,782	
Arthritis	6,222	
Cardiology	1,216	
Chest	2,517	
Dermatology	9,447	
Diabetes and Metabolism	3,383	
Ear, Nose and Throat	11,001	
Eye	25,276	
Gastrointestinal	1,408	
Gynecological Treatment	2,268	
Gynecological Consultation	1,981	
Peripheral Vascular	3,717	
Physio Consultation	10,639	
Proctology	3,842	
Social Hygiene	2,079	
Surgery Consultation	3,196	
Urology	3,604	
Orthopedics	6,575	
Neurology	1,481	
Total Medical Specialties		145,524
(C) Special Medical		
Administrative Visits	32,426	
Applicant Examinations	679	
Chalazia	261	
Pterygia	12	
Cystoscopies	270	
Endothermies	319	
Minor Surgical Operation	237	
Emergencies	291	
Total Special Medical		34,495
Total Doctor Services		281,758
II. Therapy		
Injection Therapy	13,782	
Physio. Therapy	37,645	
X-Ray Therapy (Superficial)	844	
X-Ray Therapy (Deep)	1,838	
Total Therapy		54,109
III. Diagnostic		
Audiometry	269	
Basal Metabolism Rate Determination	1,701	
Biopsies	809	
Electrocardiography	10,329	
Laboratory	91,400	
Miniature Chest X-ray	31,113	
X-ray	22,947	
Total Diagnostic		158,571
IV. Supplementary		
Nutrition	6,845	
Social Service	3,668	
Total Supplementary		10,513
V. Disability		
District Visits	35,662	
Office Visits	25,103	
Retirement	162	
Total Disability		60,927
Total Services		565,878
Prescriptions		117,984



Screening

MUCH unsuspected pathology has been uncovered by routine chest x-rays and routine laboratory tests: urinalysis, hemoglobin and blood serology, performed for every patient. These routine screening procedures are a preventive medical measure which enables the Center to take care of those presently unimportant conditions which, neglected, may impair health.

Screening eliminates too many patient visits when findings are negative as well as initiates further medical work where it is indicated, all abnormal findings being followed up. Since many of the Center patients attend the institution sporadically, often not returning for a repeat visit when their acute symptoms subside, the screening acts as a check on the possibility that anything may be overlooked.

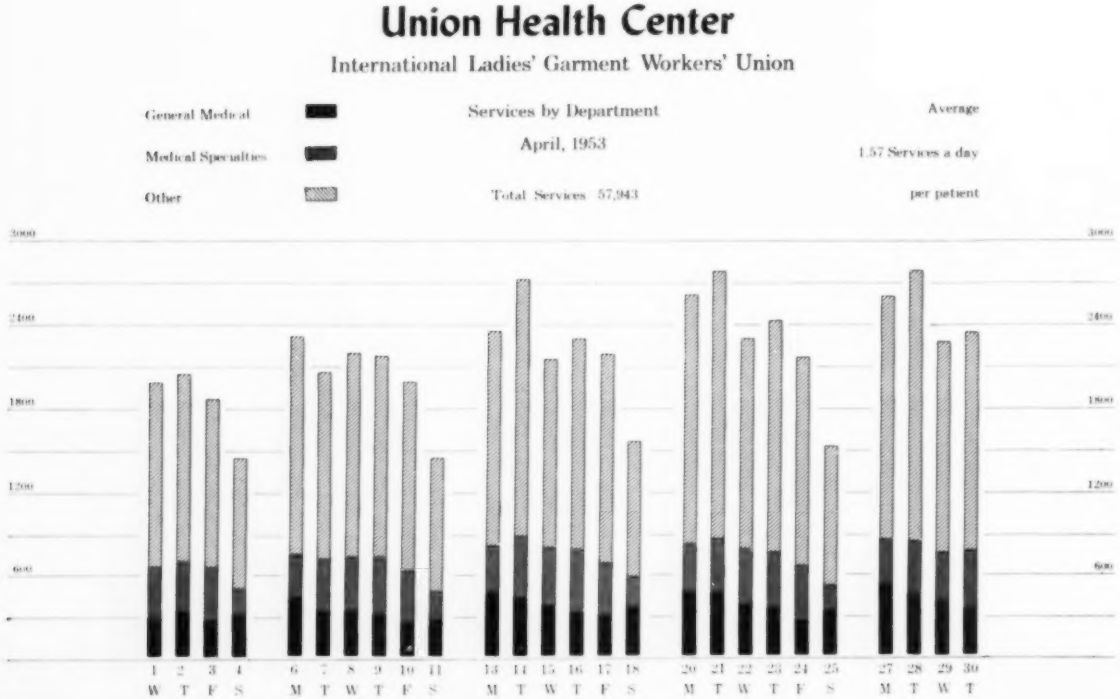
About 30,000 miniature chest x-rays are done each year for ILGWU members at the Center. In one year x-ray readings of these films suggested approximately 5,000 abnormalities of the heart and blood vessels; 38 active tuberculosis cases were ultimately diagnosed from 1,482 cases which had significant shadows requiring persistent follow-up and re-examination. In addition the miniature x-rays suggested 82 tumors of the lung, 1,000 other lung conditions of varying significance, and 200 findings in the mediastinum, of which 76 were considered substernal thyroids.

The three laboratory examinations—urinalysis, hemoglobin and blood serology—performed for each new patient, daily uncover unsuspected cases of diabetes and anemias. Sickle cell anemia and Mediterranean anemias have been found among the workers originally from southern states, Puerto Rico or Mediterranean areas who are now employed in the New York City garment trades.

REGISTER OF SERIOUS CONDITIONS: The Center devotes particular attention to members who have a serious illness which requires special handling. Since 1950 the work has been done by means of a follow-up department which keeps in constant touch with those who are found to have serious conditions. This department strives to arrange for immediate care with the aim of preventing or postponing disability. The Center's responsibility is to see that these members are properly cared for, either with its own facilities or through a community agency or other agency.

CANCER AND OTHER MALIGNANT GROWTHS: The Cancer Register was set up in November, 1950. It now has 620 cases on register, many of which are under constant follow-up. For example, 1,213 biopsies have been taken during the last two years at the Center for microscopic study. Seventy-seven proved to be malignant, needing immediate treatment, and 133 were benign growths which were placed under constant medical observation.

Many unsuspected tumors have been discovered by x-ray studies. X-rays performed in 1952 of



the gastrointestinal tract, the urinary system, the chest and the long bones revealed 102 neoplasms, of which 57 proved to be malignant.

One hundred cases of carcinoma of the breast have been discovered in the past three years in the Center's clinics. In every case the Center was able to see that immediate treatment was secured. Seventy-six cases of neoplasm of the lung have been registered, many of which were discovered through miniature chest x-rays employed during routine screening examinations.

DISEASES OF THE BLOOD: A total of 273 cases of blood abnormality are registered, of which 36 have proved to be malignant.

DIABETES: A program of diabetes control has been put into effect during the last three years. Cases revealing the presence of sugar in the urine are placed in a diabetes register and checked at regular intervals. At present 2,005 diabetics are being followed. Of 225 cases among this group, one-third did not have previous knowledge of diabetes before coming to the Center. It is difficult to estimate the number of unknown diabetics among the garment worker population in New York City, but it may be that as many as two persons out of every 100 garment workers have diabetes and many of them are unaware of this fact.

HEART DISEASE: Many garment workers show evidence of cardiac abnormality, but of these only a small percentage need constant attention in the cardiac service. Cardiac enlargement is a common finding through miniature x-ray.

Seventy-five percent of the workers with heart disease attending the cardiac clinic are working in the industry, and more than 90% of the cardiac members are over 40 years of age. Members who have suffered a heart attack can often return to work, providing they receive good medical support and are able to rest adequately. The seasonal employment in the garment trades is a boon to cardiac workers since it permits them to rest without detriment to their employment.

GYNECOLOGY: From an estimated 3,000 cases of uterine fibroids a detailed study was made of 350 cases. Conservative management of these cases by the Center was found to be possible without resorting to excessive surgery.

TUBERCULOSIS: A total of 5,314 cases of tuberculosis are registered as either healed, arrested, or cured. These cases are reviewed and called back for supervision as necessary. Conservative follow-up procedures have been developed that reduce supervision to a minimum and avoid loss of time from work.

Active cases of tuberculosis discovered in the clinics or through routine x-rays receive prompt attention. An excellent relationship is maintained with three sanatoria where every effort is made

to insure the speedy recovery of members with tuberculosis and their return to the industry.

Eye Service

WORKERS in the needle trades are greatly in need of competent eye service since their skill and productivity and, therefore, their income depend upon their vision. In many crafts the operating distance at which the worker must see clearly is different from his reading distance. His glasses must be adjusted for these differences and must be ground so that proper correction is obtained. Since the Union Health Center ophthalmologists are acquainted with the requirements of the various crafts, refractions done at the Center are more likely to be helpful from an occupational point of view.

Social Service

THE SOCIAL SERVICE department aids ILG members requiring special help with family problems such as an invalid parent, or personal problems of adjustment to a difficult life situation, and mental illness. In addition this service assists members needing hospitalization for acute illness, convalescent care, and help with numerous other situations with which the average individual cannot cope. The Social Service department makes full use of the welfare and health agencies of New York City in solving these problems.

Nutrition

GOOD nutritional advice supplements the medical service rendered at the Center. The nutritionists interview patients, upon the order of the clinic physicians, to discuss diets and help the person make the necessary adjustments in his eating habits to improve his health. Patients at the Center respond well to this painstaking assistance with nutritional problems. Return visits requested by the nutritionist are kept and diet adjustments are usually achieved. A great need exists for more nutritional education, so that poor eating habits may be replaced by health-maintaining ones.

Surgical Control

THE Union Health Center maintains the equivalent of a hospital out-patient service and, therefore, has never considered major surgical procedures to be within its province. Nevertheless, in view of the volume of serious conditions encountered among patients, it makes certain that patients needing surgery receive proper treatment. Its concern is to see that the patient gets needed surgery from a qualified surgeon in a proper institution irrespective of whether the surgeon is a member of the Center staff. It sees that the patient has an opportunity to choose his own surgeon, even though he may receive advice concerning surgery at the Center. To this end the Center cooperates fully with the medical profession and the hospitals in the community, and a procedure of administrative control is in effect at the Center to accomplish these objectives.

Retirement for Disability

IN 1949 the Cloak Joint Board extended its pension program (for 65 year old members who wish to retire from the industry) to cover members 60 years of age or older whose physical infirmities prevent them from carrying on their work. The Center was asked to determine which applicants for premature retirement were totally and permanently disabled.

A total of 356 workers have applied for disability retirement. Two hundred and thirteen of these were totally and permanently disabled; 63 were not considered totally and permanently disabled; and 18 have been deferred for further examination at a later date to determine whether the disability is permanent.

Nineteen members died before examination, and 29 totally permanently disabled members died after they were pensioned.

As might be expected from their age, the greatest number of applicants were found to be suffering from diseases of the heart and circulatory system. The second largest group had visual defects resulting in occupational blindness. Many advanced cases of arthritis were retired, and members suffering from Parkinsonian syndrome were found totally and permanently disabled.

About Finances

IN 1952 the expenditures for the Union Health Center were $1,484,051, and 565,878 services were performed.

The operation of the Sickness Insurance Department cost $146,100, and the operation of the Pharmacy cost $77,300. The medical service costs, therefore, came to $1,260,651.

The cost per service was $2.62, but the average cost per medical service (excluding drugs and sick benefit) was only $2.49.

An average of 2.5 services were performed per eligible member, at a total cost per member of $6.27. In 1952, 201,200 members were eligible for service. The number of actual patients receiving service at the Center numbered 48,912 in 1952. The total number of members receiving some service from the Center, including sickness insurance, was 72,312.

Each patient at the Center (both members and their families) received an average of 10.3 services, although union members who were patients at the Center received an average of 10.5 services

each, and the 3600 non-members received an average of 8.5 services each.

The average cost for each patient who received service was $25.77.

Conclusion

THE institution has come a long way since its founder, Dr. George Price, inaugurated the first experiment in the provision of medical care under the sponsorship of the worker-beneficiaries themselves. This early effort in industrial medicine aroused the interest of the Surgeon General of the United States Public Health Service who made the first study of the health needs of these workers in cooperation with Dr. Price. This study uncovered the high incidence of tuberculosis and the prevalence of other chronic diseases and stimulated the union leaders to attempt to ameliorate the conditions.

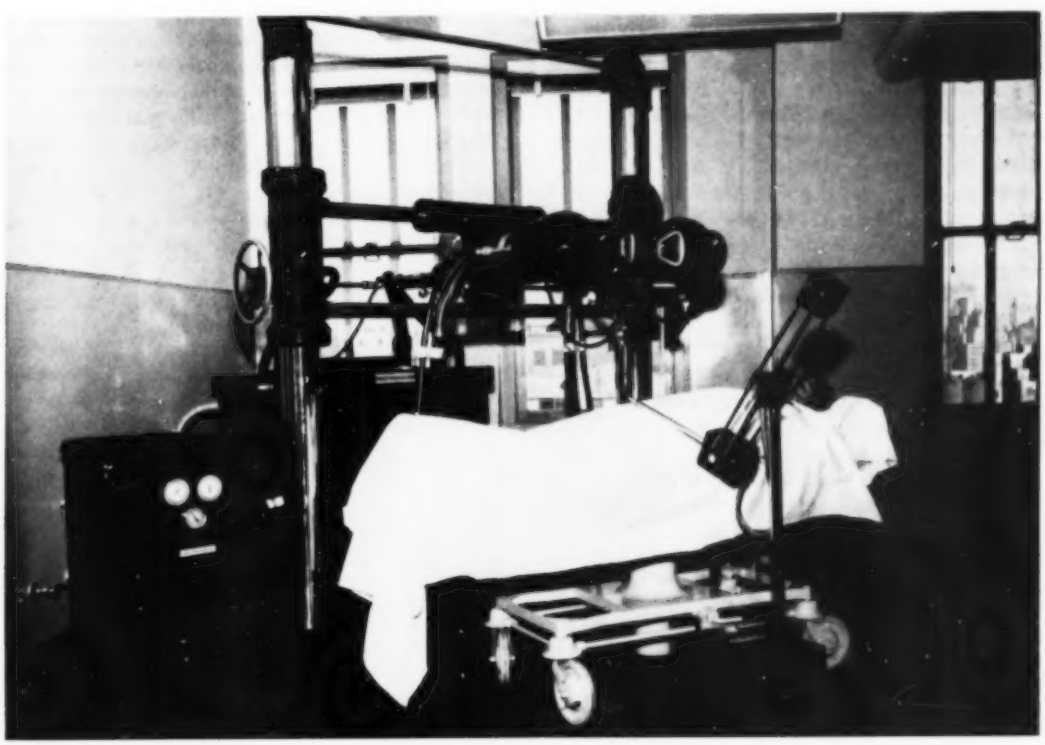
Dr. Haven Emerson states (Union Health Center Report, 1943):

"In the social and economic sense it may be that the contribution of Dr. Price was at least as great as for medical purposes, for he was a devotee of the oft neglected virtue of organized thrift. While the merchants of the city urged upon the people an installment system of buying more than they could afford of goods and the conveniences of the household, Dr. Price made it popular to invest in the enduring satisfaction of good health through pre-payments by groups of persons whose entire livelihood and security of existence depended upon their most precious asset, personal health."

After the death of Dr. George Price, when his son, Dr. Leo Price, gave up the private practice of medicine to become Director of the Union Health Center, the phenomenal rise in the demand for services stimulated by the advent of health and welfare funds made new concepts of clinic operation necessary. Providing care for as many as 2,000 patients a day required the clinic to focus attention on the early detection of pathology and its treatment. Such measures gave hope of postponing the disabling illnesses of the older age worker.

Utilization has been made of modern mechanical methods of operational efficiency, including the use of International Business Machines for record keeping, Addressograph equipment and pre-printed forms for speedy registration, and mechanical conveyors to transfer medical records from floor to floor.

This program of preventive medicine in industry is being operated to satisfy the primary health needs of the workers. Efficient management enables the Center to provide the service within the economic limits imposed by prudent control of the funds available for the workers' health requirements.



The Public Health Service

DURING its 40 years of activity, the Division of Occupational Health of the United States Public Health Service has made significant contributions to the progress of industrial health. Particularly outstanding has been its research on dust diseases, especially silicosis, industrial dermatology, and toxicology. Not only has its research assisted in improving working conditions but, in carrying out its investigations, it has served also as a training ground for men who were later to become leaders in the field of industrial health.

The Division has traditionally dealt with studies on the cause, effects and methods of preventing occupational diseases as well as the development and promotion of high standards of industrial health practices. Success in bringing about the adoption of these hygienic standards has not been based on enforcement legislation but on the mutual cooperation and respect of management, labor, and government.

During the early part of the twentieth century silicosis was rampant in the dusty trades and was accepted as a necessary risk of the occupation. Because of the apparent relationship between silicosis and tuberculosis the Division, in cooperation with the U.S. Bureau of Mines, undertook an investigation of these diseases in the Oklahoma, Kansas, and Missouri areas, beginning in 1913. A distinctive feature of this investigation was the evolution of the epidemiologic approach to occupational diseases, a technique long familiar to Public Health Service officers because of their experience with communicable diseases. This investigation was one of the earliest attempts to correlate on a mass scale medical findings with the occupational environment.

Subsequent studies in cement, asbestos, coal, talc, and other industries led to the development of fundamental information regarding the etiology and prevention of dust diseases. The Public Health Service dust studies helped immeasurably in the assaying of dust exposure by the development of the Greenburg-Smith impinger and the light field method of counting. They assisted in defining the role of such factors as particle size, composition of the dust, duration of exposure, and led ultimately to the adoption of five million particles per cubic foot of air as a maximum allowable concentration for pneumoconiosis-producing dust.

These studies culminated in the publication in 1935 of Bulletin 217, "Determination and Control of Industrial Dust," which is a recognized text on the measurement and quantification of industrial dust. Lanza, Thompson, Greenburg, Bloomfield, Dreessen and others will long be remembered for their work in the field of dust diseases. Although these early studies solved many fundamental problems, the roles of other, more subtle factors still need to be ascertained. It is hoped that the Division's current studies in the uranium mines, the diatomaceous earth industry, and those proposed in other industries, may throw further enlightment on this subject.

DURING these early formative years of the Division, the United States was realizing its industrial might. This development of industrial maturity brought with it many sociological, legislative, and health problems. The solution of many of these has been a slow evolutionary process to which the Division of Occupational Health has contributed through its investigations of working conditions, tuberculosis and pneumonia among workers, the value of health insurance plans, and child labor, and the promotion of workmen's compensation legislation, especially for occupational diseases. Significantly, one of these early investigations was in the workshops of the garment industry, where the existence of unsanitary conditions, poor illumination and ventilation, and an abnormally high rate of tuberculosis was substantiated. This investigation helped to lead to the abolishment of the sweatshop and the establishment of one of the first worker health programs. Schereschewsky and Winslow were pioneers during this era of the Division's development.

Prior to the interest of the Public Health Service in the field of industrial hygiene, the study of occupational diseases was limited to observations on the part of a few clinicians on a restricted number of patients and without the benefit of environmental data. The techniques developed by the Public Health Service in its dust studies made possible future clinical studies on large numbers of workers and the correlation of these findings with environmental conditions. These methods yielded in a relatively brief period detailed information on the clinical aspects and cause of the disease, and revealed methods of prevention.

The chief value of these techniques lies in the fact that careful and detailed examinations of a large group of people whose working environment has been accurately documented could be

made on an industry-wide basis. Over the years this method of study has assisted in the clinical documentation of numerous occupational diseases.

One notable example has been the virtual elimination of mercury poisoning and a greatly lowered incidence of lead poisoning. A more recent study (1952) proved an unusually high rate of lung cancer existed in the chromate producing industry and implicated a heretofore unsuspected chromate complex as the causative agent. Our knowledge of the toxic action of the heavy metals has been increased immeasurably through studies made by McConnell, Jones, Sayers, Neal, Flinn, and Britten.

Studies on radiation were begun as early as 1923, when physical examinations were instituted on employees handling radium in the United States Bureau of Standards. Later, investigations were made on the radium dial painting industry where the ingestion of radium resulted in numerous fatalities. Subsequent studies of x-ray and other forms of radiation led to the creation of a radiation branch of this Division.

IN 1931, the Division launched a full-scale program of study of industrial dermatoses. Initial studies instituted by Schwartz in the candy, silk-dyeing, fur-dyeing, and oil industries have since been extended by Campbell and others to every industry group in which there is a significant skin disease hazard. These investigations have contributed to a vast store of knowledge of the cause, cure and control of this most common occupational disease, and have materially assisted in the development and perfection of protective creams and clothing and in the classification of skin irritants. These classic studies are being continued by Birmingham and others, with special emphasis on research and dermatologic properties of new chemical compounds.

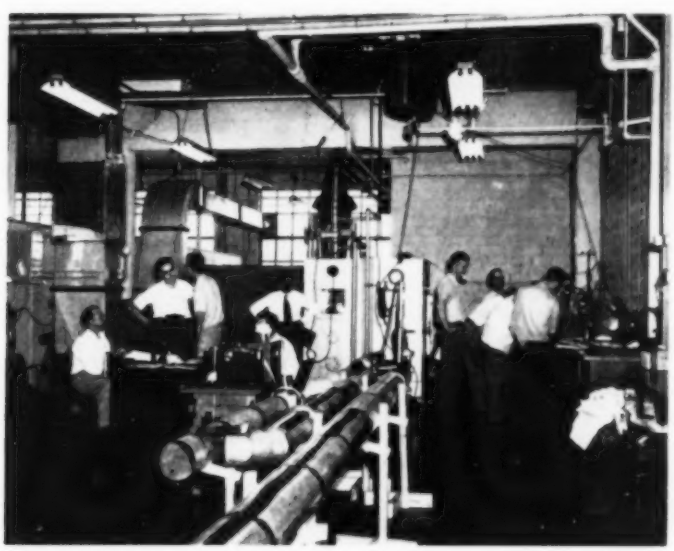
The collection and analysis of industrial sickness absenteeism data is another important facet of the work of the Division. Early work in this field was started by Sydenstricker in 1913, but the volume of data collected was expanded in the early twenties by Brundage. Since 1936 Gafafer has issued periodic reports on the causes and duration of sickness absenteeism in a group of American industrial plants. These data, which represent the only collection of its kind in this country, have served to point up the health problems of the industrial worker and the magnitude of lost time due to illness. The studies also have stimulated the development of in-plant health programs.

When the Scientific Research Division was consolidated with the National Institute of Health in 1937, the Office of Industrial Hygiene and Sanitation became the Division of Industrial Hygiene of the National Institute of Health. This, for the first time, provided the Division with adequate scientific and research laboratories. This was the beginning of defense related activities which for the next nine years were to account for the Division's primary efforts.

Many basic studies in aviation medicine including the effects of altitude exposure, the effects of decompression at high altitudes and the testing of breathing apparatus were carried out in the research laboratories under Neal. This era also saw the inauguration of a series of toxicological studies under Fairhall and von Oettingen, which included toluene, vanadium, beryllium, manganese, vinyl cyanide, and lead azide, as well as many others.

One of the Division's major activities was the protection of employee health in government-owned, privately-operated munitions plants. Among the special investigations conducted were studies of TNT poisoning, the hazards associated with the manufacture of smokeless powder and frangible lead bullets, x-ray exposures, and mercury hazards.

As a result of the Division's work, disability and death rates from toxic exposures were lowered to a point never before achieved. The progress may be illustrated by a comparison of



Group at left are calibrating halogenated hydrocarbon detector. Group at right are calibrating mercury vapor detector. Course for Industrial Hygiene Engineers, Cincinnati, June 1-12, 1953.

the number of cases of occupational diseases arising from the manufacture of TNT during World War I and World War II. During seven and one-half months of World War I, 475 workers in American arsenals died and 17,000 were disabled because of TNT poisoning. In this war the United States was supplying only 40% of the ammunition for the Allies. In World War II, when the United States supplied 95% of the ammunition for its Allies, close supervision of TNT operations by industrial hygienists succeeded in controlling the hazard so well that there were only 22 deaths in 35 months.

The consultative work of the Public Health Service in the field of industrial hygiene with other Federal agencies and state health departments was an important factor after 1920. In 1936 the state's relations phase of the work, headed by Bloomfield, assumed a new importance following the passage of the Social Security Act, which provided funds for the development of public health programs, including industrial hygiene, in the states. Industrial hygiene programs in the states were given further impetus in 1947 when $1,000,000 of general health grant-in-aid funds were earmarked for such activities.

In testimony to the importance of industrial hygiene as a public health activity, today there are industrial hygiene units in 41 states, two territories, 15 city and county health departments, and the District of Columbia. Because of the tremendous increase in the states' relation work, the Division of Industrial Hygiene was transferred in 1944 from the National Institute of Health to the Bureau of State Services. This administrative transfer resulted in the loss of the research laboratories which were not to be restored until 1951.

Two of the most significant contributions to industrial hygiene made by the Division have been the development of the epidemiologic approach to occupational diseases and the development of state programs. With this assistance industries have solved many serious occupational disease problems.

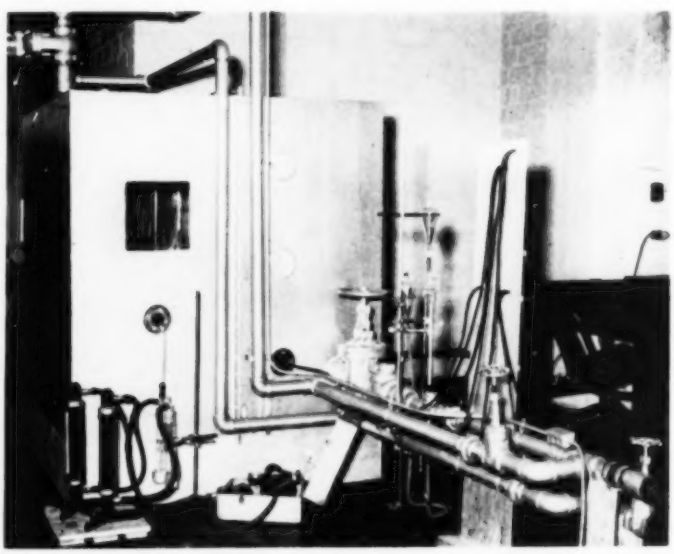
Today interest centers on the individual worker and all his health needs. By fusing environmental protection with plant medical services, industry has found it possible to conserve its manpower and maintain the general health status of the worker to an extent never before realized.

Since World War II, and especially under the leadership of Miller, the Division of Industrial Hygiene, renamed Division of Occupational Health, has fostered this concept of the total health needs of the worker.

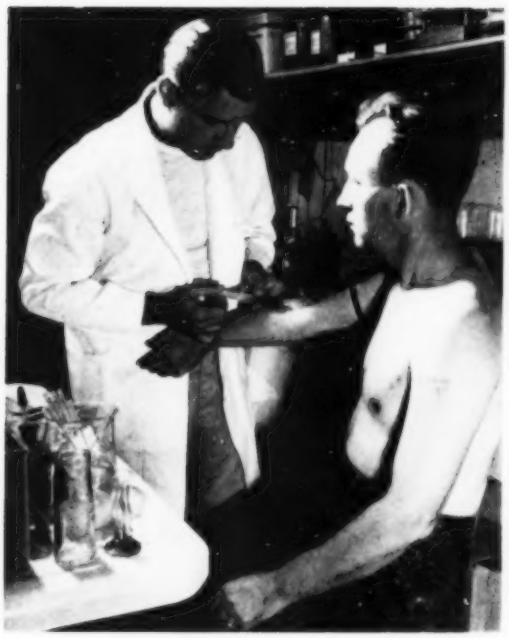
One aspect of industrial health which is receiving more attention is that of mental health and human relations. In recent years management and labor have come to realize that problems of employee interpersonal relations often result in emotional disturbances and other adjustment problems which directly affect the mental well-being of the worker and consequently affect production adversely. Reliable estimates indicate that a large proportion of reported sickness absenteeism is actually due to emotional disturbances and human relations. Even though the importance of this activity is well recognized by leaders in the field of occupational health, it is probable that progress will be as evolutionary as progress in the control of occupational diseases. These emotional problems as well as the general health problems of workers will be solved only by the establishment of health services in industry.

The development of in-plant health services poses a special problem in small plants, which employ 70% of the nation's workers. Although there are many variables the answer may lie in pooling the resources of neighboring plants and collectively employing a physician and nurses to provide part-time services to participating plants. As a start in this direction the Division has analyzed and compiled data on health programs in both large and small plants.

Another post-war concept was reflected in the decentralization of the Division's technical ac-



Dust control chamber, for setting up known concentrations of dusts, gases, and fumes for calibrating instruments and perfecting analytical techniques. Division of Occupational Health Field Headquarters.



Blood sample—during the chromate study.

Vital capacity determination—chromate study.

tivities. Because of the demand for services and the rapid industrialization of the western area a field station was established in Salt Lake City, Utah, in 1949. This station carries out the traditional technical activities of the Division in the western states. In 1951 the Division's scientific laboratories were moved from Washington to Cincinnati, which allowed an expansion of research and laboratory investigations.

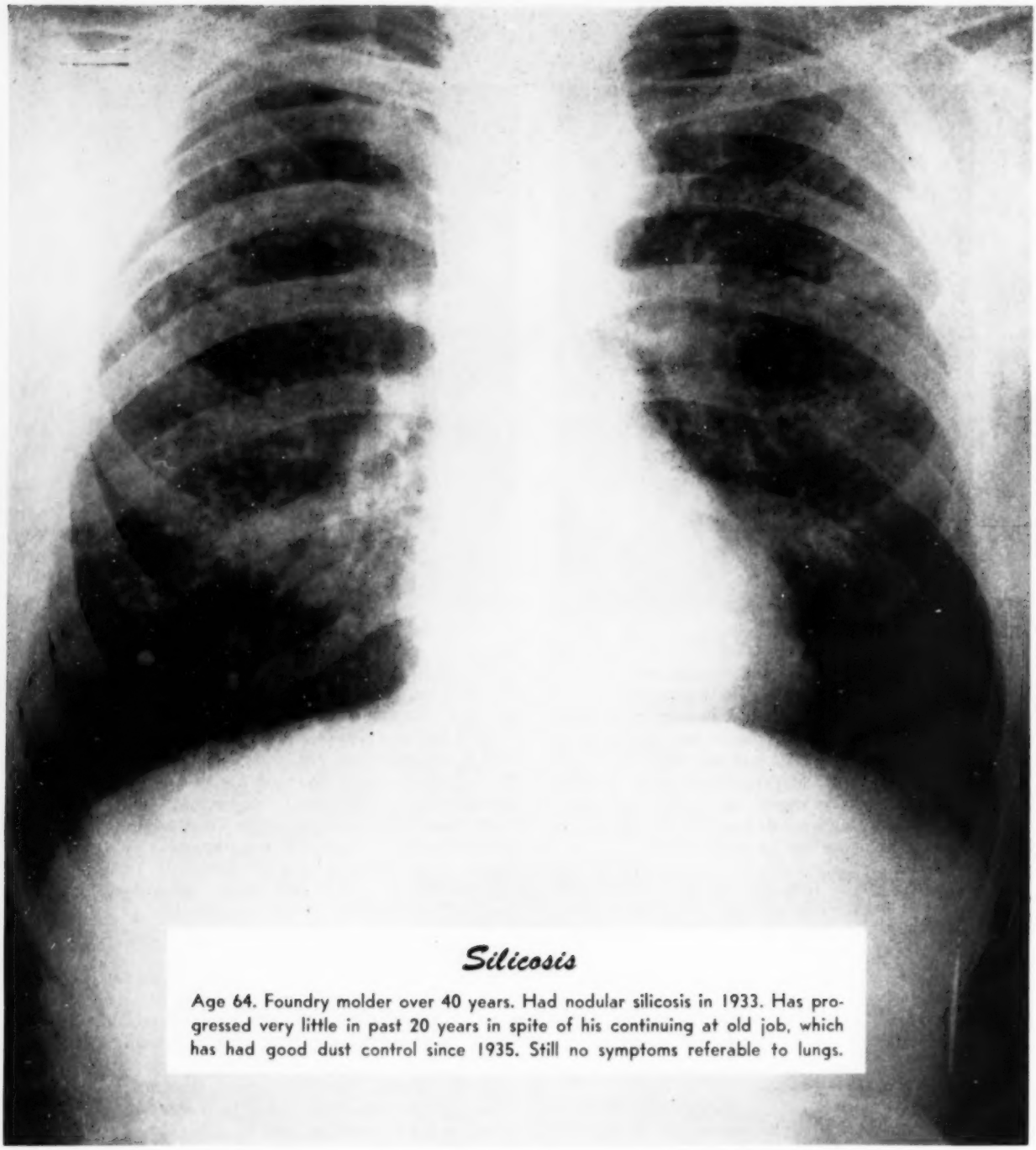
THIS thumbnail sketch brings us to July, 1953, and the present program of the Division. Field studies are presently centered about the following: A study of the health hazards associated with the mining and milling of uranium ores; a study of a dust disease presumably caused by diatomites; an industrial noise study and its relationship to hearing acuity; and a study of the possible carcinogenic properties of shale oil.

In the laboratory, important research is under way on the toxicity of a number of industrial compounds including vanadium and cobalt, an evaluation of dust counting methods, an appraisal of industrial hygiene instruments, the development and improvement of new chemical and analytical methods, and the cutaneous effects of certain industrial compounds. In line with its policy of developing up-to-date data on occupational diseases, the Division is currently conducting preliminary studies on the incidence and nature of coal mine pneumoconiosis and the clinical effects of long term exposure to low grade radiation.

The administrative office remains in Washington with Dr. S. E. Miller as Division Chief, and Mr. J. E. Flanagan, JR., as Assistant Chief. The Special Services Branch, also located in Washington, is headed by Mr. Henry N. Doyle; Dr. W. M. Gafafer serves the Division as a technical assistant to the chief. Dr. Clark Cooper, Chief of Field Headquarters, is located in Cincinnati, and is ably assisted by the following branch chiefs: Dr. D. J. Birmingham, Clinical; Mr. C. D. Yaffe, Engineering; Dr. H. E. Stockinger, Laboratory; Mr. D. A. Holaday, Radiation; and Dr. L. J. Cralley, Chief, Occupational Health Field Station, Salt Lake City, Utah.

The Public Health Service is proud of its part in the development of a more healthful environment for the American worker. No crystal ball is necessary to insure us that an ever-expanding industry will create more and new industrial health problems. The Division of Occupational Health takes this opportunity to pledge to its colleagues, to industry, and to labor its continued interest in the health of American workers.

The Directors of the Division of Occupational Health, Public Health Service, since 1914 have been Dr. Joseph W. Schereschewsky, 1914-18; Dr. Anthony J. Lanza, Mr. Bernard J. Newman, 1918-21; Dr. Lewis R. Thompson, 1921-30; Dr. James P. Leake, 1930-32; Dr. Royd R. Sayers, 1932-40; Dr. Paul A. Neal, 1940-41; Dr. James G. Townsend, 1941-51. Dr. Seward E. Miller is now the Director, 1951—.



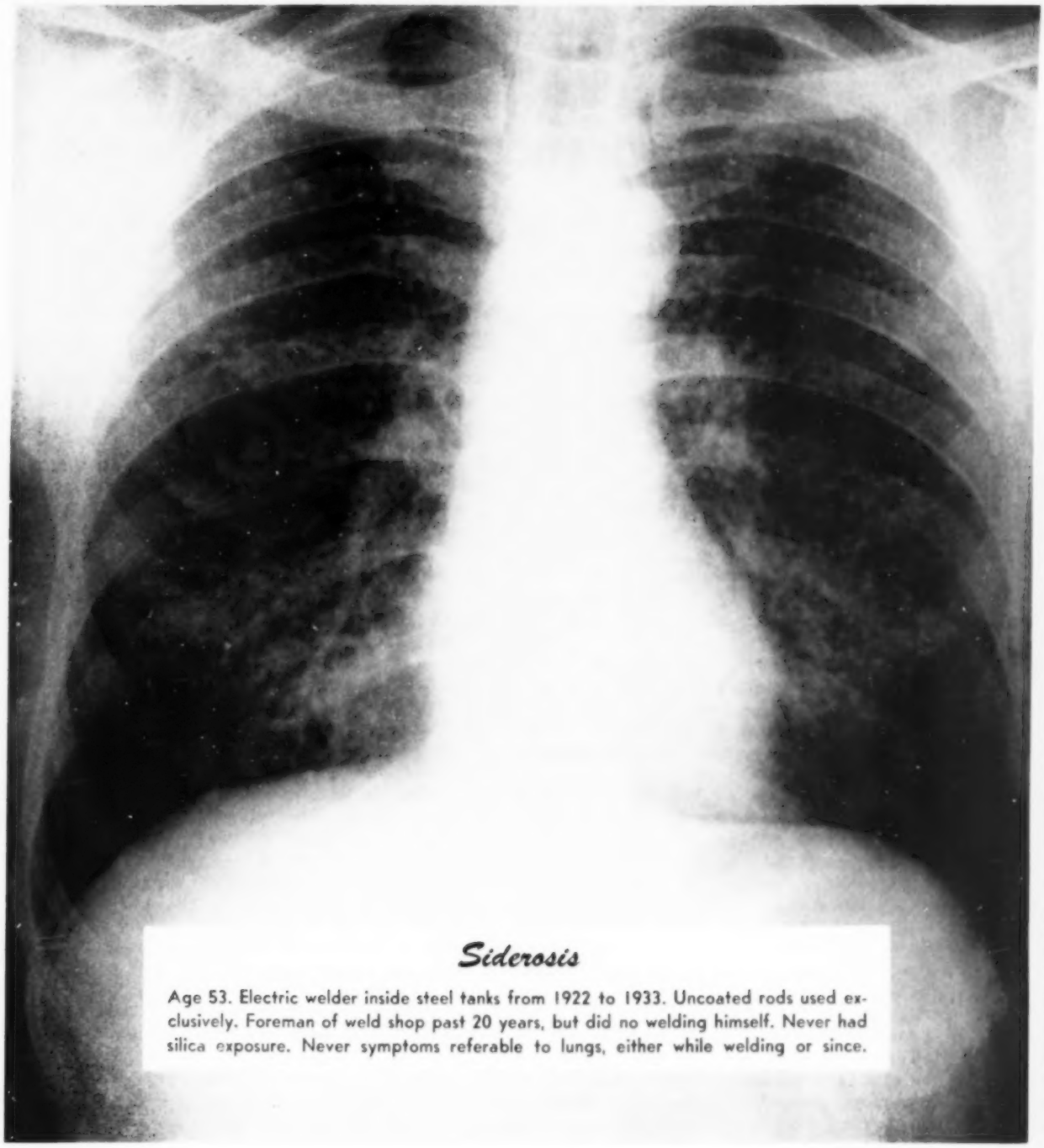
Silicosis

Age 64. Foundry molder over 40 years. Had nodular silicosis in 1933. Has progressed very little in past 20 years in spite of his continuing at old job, which has had good dust control since 1935. Still no symptoms referable to lungs.

Of the near 3000 forms in which occupational diseases have appeared . . . . .

DIFFERENTIAL

In silicosis case, note large dense root shadows on both sides and irregular dense nodulation, as opposed to normal size and density of root shadows and softer and more uniform nodulation in siderosis case. The radiological differential diagnosis of these two entities was one of the significant advances in



Siderosis

Age 53. Electric welder inside steel tanks from 1922 to 1933. Uncoated rods used exclusively. Foreman of weld shop past 20 years, but did no welding himself. Never had silica exposure. Never symptoms referable to lungs, either while welding or since.

. . . . . these two are symbolic.

DIAGNOSIS

our knowledge of dust diseases of the lungs in the past 15 years. Such differential diagnosis is essential because silicosis of this degree may become disabling, whereas siderosis never does, and silicosis may predispose to tuberculosis, whereas siderosis never does.

The Insurance Companies

WARREN A. COOK, in his Cummings Memorial Lecture at the meeting of the American Industrial Hygiene Association in April, 1953, described the industrial hygiene division in the casualty insurance business as "a unique American institution." With the single exception of Belgium, the United States is the only country in which private enterprise is insured by private enterprise. It is a characteristic of private enterprise that it must conduct its business efficiently. In workmen's compensation coverage, as in all insurance, premiums have a relation to losses —the fewer the casualties the smaller the claims total, and this in turn results in smaller premiums. Efficiency, and competitive necessity, impose the obligation upon the insurer to keep its claims total at a minimum so that the premiums it must receive will not be excessive. Instead of merely accepting claims as they are made and resisting them to the utmost in order to keep casualty payments down, the enlightened managements of the leading insurance companies have sought their efficiency of operation in the opposite direction—they are doing all in their power to prevent the casualties; they are extending aid in preventing injury to the worker. This is a laudable aim—the insurer holds its competitive position; the insured is benefited by way of reduced premiums; and thus both gain. But there would be no gain for either unless there were the earlier, primary gain for the worker. Basically, it is his loss that is prevented. And wherever his loss can be prevented, the chain of losses which his casualty experience starts in motion, is headed off at the source. Thus the casualty companies align themselves with the purpose of all industrial medicine—the conservation and preserving of every worker.

Throughout the country "some 21 of the leading insurance companies, agencies, and associations have personnel especially trained in industrial hygiene. Sixteen of the companies maintain industrial hygiene divisions; 14 have industrial hygiene laboratories." Organization of industrial hygiene within the casualty insurance company follows a pattern but varies in the extent to which certain elements are included. The greater part of the activity has been in the field of accident prevention. Since traumatic injuries are much more frequent and cause much more lost time than occupational diseases, the latter in terms of compensation claims paid, amount to about 1½% of the total. That, however, is no gauge of the proportion of costs that may be involved. These are so disproportionate that the major function of the insurance company unit—essentially the same as the units connected with other organizations—is to keep health hazards so well controlled that occupational diseases do not occur.

The accomplishments of the industrial hygiene divisions of the casualty companies through the cooperative work of their safety engineers and specialized industrial hygiene personnel, together with industry, include such a reduction in the environmental hazards to health that occupational disease compensation rates have been decreasing over the last 15 years in all industrial classifications involving specific occupational disease hazards. A number of agencies have contributed to this result, but it is to be noted that the impact of the insurance companies' staff has exerted a marked influence.

About 15 years ago certain of the casualty companies began thinking, not less in terms of the industrial environment, but more in terms of the industrial worker. The development of modern technology was forcing a shift in emphasis from "machine" maintenance to "human" maintenance. The prevention of human waste in industry, primarily an engineering problem involving machines and methods, was reaching "a sort of plateau" where the old techniques were showing small returns for the dollar invested. It was necessary to extend the horizon of prevention past the point of engineering methods for the environment and into the area of medical methods for the individual. This required the projection of the insurance companies' preventive abilities into industrial medicine. Today, that is where some of them are doing their most effective work in prevention. This is making itself felt in an ever-widening range of industries.

Insurance Company Programs

OUTSTANDING in its concept and application of medical methods is Liberty Mutual Insurance Company, of Boston, the largest carrier of workmen's compensation. Its range of application of these methods is toward the kind of human maintenance that will keep human losses at a minimum. For many years its Loss Prevention Department had been making available to its industrial policyholders the services of consultants in engineering and the allied sciences. About 10 years ago it began adding the availability of advice and counsel in matters of industrial health

—consultants in industrial medicine and industrial nursing, to provide such information for the assistance of management. The company started with a part-time physician and two nurses. Now Liberty Mutual has seven full-time physicians, several part-time physicians, and 23 nurses—all experienced in both the philosophy and the practice of industrial medicine in the large plant and in the small plant. The principal divisions into which its procedures fall are: industrial engineering (elimination of mechanical hazards); industrial hygiene (prevention of dangerous exposures to chemicals and conditions hazardous to health); industrial preventive medicine (maintenance of day-by-day contact with the physical and mental problems of employees through in-plant medical programs); claims medical service (organization of consulting services and therapeutic facilities in such a way as to promote maximum physical recovery with minimum delay); and rehabilitation (restoration of handicapped people as nearly as possible to normal life and economic independence).

Liberty Mutual is especially emphasizing the increasing need for bringing the industrial nurse up to the highest standards of professional possibilities; its aid in this direction is extended through its advisory counsel, its staff of consultant nurses, and periodic refresher courses. These refresher courses include a complete indoctrination in the whole field of what Liberty Mutual regards as a distinct specialty—industrial nursing, as differentiated from general or hospital nursing. This specialty includes a thorough historical knowledge of the background of industrial nursing; acquaintance with all of the methods of loss prevention, including engineering, industrial hygiene, personnel, and medical practices; a working knowledge of the legal aspects of workmen's compensation and the proper methods of claim handling; and emphasis upon the rehabilitation of every injured workman, starting at the time the accident occurs until such time as the worker can be returned to the status of a self-sustaining economic unit. In addition, there is needed a thorough knowledge of record systems and their application to the needs of the plant—particularly in pin-pointing the areas that need investigation and corrective procedures, and also in focusing upon the individual worker who can be benefited by better methods. The refresher courses stress the methods of treatment which are accepted as the best by the medical specialists.

This concept of the place of the nurse in industry is that she is not only the "handmaid" of the supervising medical officer, but also that she is expected to show initiative, judgment, and assistance in the development of programs of health maintenance suited to the needs of the plant; in a certain sense, it may be said that she is the plant health officer in the majority of instances. Liberty Mutual's belief is that health education on an industrial basis is best carried on by personal contact between the medical personnel and the individual worker. And Liberty Mutual is definitely committed to the policy that the nurse should be working under the supervision of a physician designated by management and reporting to management.

AMERICAN Mutual Liability Insurance Company, the first mutual liability company in the United States, and presently the fifth largest mutual casualty company, has "grown up" with Industrial Medicine. Among its distinctive services to the field has been its Medical Seminar program. This program was inaugurated as a public service to the medical profession in 1939, and grew out of the recognized need for postgraduate education in this specialty. Its purpose has been to help industrial physicians to care for the casualties of industrial life. Nineteen of these courses have been held at key industrial centers throughout the eastern portion of the country. Some 200 original papers, covering almost every aspect of industrial medicine, have been presented by recognized specialists. Transcripts of these proceedings regularly have been published.

A similar program has been carried on for the benefit of the industrial nurses serving the company's workmen's compensation policyholders. Twelve of these seminars for nurses have been held since 1944.

Believing in the importance of prompt and efficient first-aid care of the industrial casualty, American Mutual has always been active in encouraging attention to this phase of Industrial Medicine. This has taken the tangible form of providing technical assistance and advice for industrial establishments, particularly the smaller ones. The company's experts have been available for making on-the-spot surveys, and much material has been distributed to the medical and nursing professions and to industry—designed to help industry do a better first-aid job.

The company operates three non-profit clinics for treatment of workmen's compensation cases. Typical is the one in Boston where the staff consists of eight part-time physicians, two nurses, two physical therapists, and a clerical staff. A variety of medical services are available here—medical evaluation and treatment, physical therapy, prosthetic appliance training, and vocational testing and evaluation. This clinic is registered as a Rehabilitation Center by the Massachusetts Rehabilitation Commission.

Over the years the company has engaged in an extensive research program designed to find the answers to several of the more perplexing problems in Industrial Medicine.

INDUSTRIAL MEDICINE AND SURGERY

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The Industrial-Medical Drama

MANY people, many pictures! The public health man sees industrial medicine as public health; the general practitioner, as "just medicine"; the medical school dean, as a trespasser in the undergraduate halls; the promoter, as the channel to a "captive" audience, or a "controlled" experiment; the lay writer, coming upon it for the first time, as his own discovery; the labor leader, as a means of bargaining; the proponent of government "health insurance," as a tool of the "interests." None of these, or their like, is a true picture. Such are taken from the periphery, and the view is tinged with the hue of the viewer's lens.

The true picture of industrial medicine must come from inside, must be taken at its center. But even from that vantage point the portrayal is difficult. There are so many centers. Each Medical Department is a center. Being among them is like being in a forest of great trees—of girths, and heights, and spreads no two alike. One needs to be in their midst to perceive that each furnishes the same pattern of shade. Some are sturdy, tall, with long, strong roots deep-bedded in the past; others' leaves are still a sapling-green. But all are growing—straight, clean-limbed, and vivid in their places. Each is a center, and the same life teems in all—the life that pulses in the veins of technology, the routine complex of tools and temperament that makes up the industrial day.

The work-life of modern times is rich in drama. Science is the author; technology sets the stage. And under the trees, as it were, within the areas of the Medical Departments that cast their friendly shadow across the whole proscenium, occur the acts and interplays that almost daily present the unity and interest of dramatic composition. At one extreme, perhaps, the too-real tragedies of hopelessly sick people trying to be well; at the other the sometimes comedies of well people trying to be sick. And in between, the intimate personal adaptations to their means of livelihood of the always many who, in various emotional or mental or physical degrees, are lame, or halt, or blind. Had he the time to add one more to the myriad of his capabilities, the Industrial Physician might be a dramatist. This by merely recording, in terms of sequence and scene, the human tragicomedy his work unrolls. It is framed in epic mold; the plot is involved; the action is continuous. There is no grand climax, no final curtain. Each actor fills his role as long as he can; another takes his place; the play goes on—the drama of life, in the cogs of inexorable Time. . . .

It is unlikely that the Industrial Physician will become the playwright, principally because he, himself, has an important role. Sometimes he is on-stage, sometimes in the wings. But always he is there. His part may vary from the activity of a prime-mover in the action to the passiveness of a catalyst in the result. Thus, to be dramatist of his work he would have to dramatize himself. That is the one thing he won't do. Long has been the conviction that he and his work should be highlighted against the backdrop of the technological stage; and this Journal has elected to do it. This Twenty-First Anniversary of its beginning acquaintance with him and his work seems the proper occasion.

And so, from the midst of the tall trees, from a vantage point among the centers, in unadorned realism, here is portrayed the Industrial Physician *as he is*, and Industrial Medicine *as it is*—with some small reference to the 21 years during which both have become what they are.

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As a recorder of this period of history-making attainments—INDUSTRIAL MEDICINE AND SURGERY has shown an awareness and maturity far beyond its chronological age. Our best wishes for your continuing and successful publication.

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Anlages

THE FOLLOWING are taken from among the anlages of the embryo from which this issue grew:

THE PHYSICIAN has come into industry to stay."

—MAGNUS W. ALEXANDER (1916).

THE names of healthy workers are written on payrolls, not engraved on tombstones."

—CAREY P. MCCORD.

THE professional talent on the career side of industrial medical practice is already so imposing that it is an honor to belong in its company."

—*Industrial Medicine.*

WHAT about the individual? Is not his welfare the principal justification of all medical effort?"

—EDWARD J. STIEGLITZ M.D.

AN OPEN door with the right kind of physician ear is the key to a really constructive preventive medical program in industry today."

—R. B. O'CONNOR, M.D., Medical Director, Loss Prevention Division, Liberty Mutual Insurance Company.

IT IS not so much that any particular industry cannot afford a health program; it is rather that it cannot afford to be without one."

—RALPH M. MONK, Vice-President, Caterpillar Tractor Company.

ONLY when one considers what industrial medicine was like 40 years ago, can one appreciate the remarkable record the country has made in that really brief period. It is a record of starting in almost complete, and wilful, ignorance, and reaching a position of what may now (1947) be called world leadership."

—ALICE HAMILTON, M.D.

WHAT is needed in a plant is a doctor to look after the human machinery, to study stresses and strains on it, to give warning of a probable breakdown, to advise easing up on the load until the human mechanism has been readjusted, to do the hundred and one things that make for comfort of mind and body."

—OTTO P. GEIER, M.D. (1916).

DURING the last quarter century the economic and social progress of the wage earning group of our national population has been highlighted by striking developments in improved medical care and by accumulated knowledge concerning the prevention, control, and management of the diseases peculiar to industry."

—*J.A.M.A.*

INDUSTRIAL medicine encompasses all the aspects of medicine that relate to industry. It includes, in addition to prevention, the diagnosis and treatment of industrial injuries and occupational disease, industrial hygiene and toxicology, mental hygiene, industrial sanitation, legal medicine, administration, employee relations, and health education. The field is broad and deep. . . ."

—W. H. SEYMOUR, Vice-President, Liberty Mutual Insurance Company.

WHAT we in industrial medicine are trying to do by an evolutionary process, because we haven't evolved our final product yet, is to make it fashionable to stay well, to work safely and efficiently, to protect earning power, and to seek a great deal more medical treatment than the majority of men would ordinarily obtain were it not for the urging of the industrial Medical Department."

—EMMETT DWYER, M.D., in *Industrial Medicine*, May, 1945.

I DEFINE industrial medicine as the broad field which is concerned with all of the health problems of employed persons, and industrial health as the objective of industrial medicine. In other words, industrial health is the end and the practice of industrial medicine is the means. Industrial hygiene I consider to be that subdivision of industrial medicine which deals primarily with the prevention of illness, occupational or non-occupational, through methods applied to the working environment or to the employed individual."

—LEONARD J. GOLDWATER, M.D., in *Industrial Medicine.*

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Medical Director: (186) Certified internist; FACS; past six years, Medical Director, one of America's leading companies; 45,000 employees; has complete charge all policies, active industrial medical affairs.

Medical Director: (187) Degrees from leading eastern schools; recognized in industrial medical affairs; well qualified, toxicological problems in petro-chemical field; past nine years, assistant Medical Director large company.

Medical Director: (188) Class "A" graduate, four years, general practice and industrial physician, industrial group; seven years, Medical Director, large regional plant of major company, automobile industry; past year, Medical Director, full charge, large company; IMA; AAIH; interested more in manufacturing plant, metals industry, requires $20-$25,000; excellent references, early forties, licensed, New York, New Jersey, New Hampshire.

Medical Director: (189) B.S., M.D., leading schools; Certified internist; trained university hospitals; one year, private general practice; three years, Assistant Medical Director, large insurance company; past year, physician and cardiologist; large company, interested in larger company with extensive program of periodic examinations with diagnostic facilities for higher level personnel; well qualified to organize such program; sympathetic to management problems; $13-$15,000; middle 30's.

Staff Physician: (190) Class "A" graduate; eight years, successful private practice as internist and physician-in-charge; familiar with workmen's compensation laws; prefers medicine in industry; well-prepared and experienced man.

Staff Physician: (191) 32; Graduate leading Eastern school; several years, surgical internship; teaching hospital; two years, USAMC; past year, successful private practice; prefers industrial medicine.

Industrial Nurse: (192) 34; single; trained leading eastern school; several years, Army Nurses Corps, staff nurse; past three years, head nurse, large industrial company.

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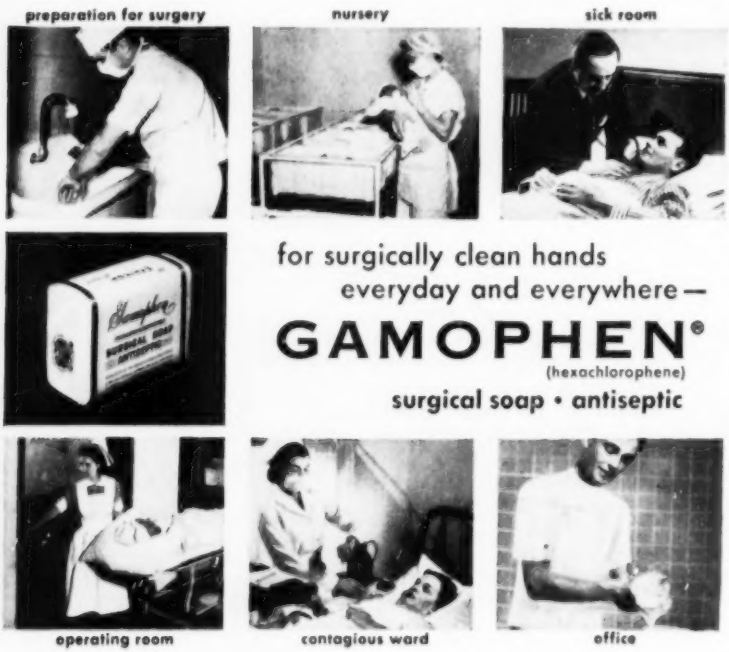
MAINTENANCE of health in industry is the goal of industrial Medical Departments. Beside the industrial physician stand the usual well known and allied professions—psychiatrist, nurse, x-ray and laboratory technicians, social workers, and, lately, the industrial hygienist. They are working together for a common goal. They are backed with the confident support of industrial management. Further development is expected. Our nation has received much from industry and expects still more. Industry has received much from industrial medicine and expects more. We in industrial medicine expect to meet the needs as they continue to develop."

—THEODORE M. FRANK, M.D., Pan American Refining Corporation.

AS A PHYSICIAN serving industry, the plant Medical Director must understand a good deal about the principles of management and of labor relations. He must be familiar with the industrial processes carried out in the plant he serves in order that he may be in a position to recommend preventive measures against the industrial hazards such as lead poisoning, dust diseases of the lungs, carbon monoxide poisoning, primary skin irritants like gunk and varsol, and the many other toxic or irritant substances that are essentials in modern industry. He must plan for first aid, accident prevention, and sanitation. He will conduct routine examinations for various specific purposes, and he will be called on for advice in placement and rehabilitation problems. He will meet, not infrequently, with lawyers, claim agents, and compensation boards, and will be expected to assume numerous and diverse duties that may extend far beyond the ordinary limits of matters medical but that have usually, in the final analysis, to do with problems of personnel. . . . Advice is available from experts in nearly all types of industrial and professional work. . . . However, in spite of so much non-medical assistance, the doctor in industry must still know and treat his patients and spend many of his evening hours studying subjects that the majority of physicians or surgeons do not have to concern themselves with.

—EMMETT DWYER, M.D., in *Industrial Medicine*, May, 1945.

THE FIELD of present-day industrial medicine in the bright colors in which I envision it—a broad panorama containing vistas of opportunity for service. We have come a long way from those earlier days when management had to look hard for a few pioneering physicians who would enter their industries and develop medical programs, and when even those pioneers were looked down upon by many physicians who felt that the care of the injured belonged exclusively to the private



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practitioner. Industrial medicine has grown, and it has grown because the changing social trend created a specific demand and need for it and because management in most cases came to see its intrinsic value in terms of productivity. It should soon be generally recognized as a specialty within the field of medicine."

—WILLIAM H. SEYMOUR, Vice-President and Manager, Loss Prevention Department, Liberty Mutual Insurance Company.

WITHIN the important field of workmen's compensation, with all of its social and economic implications, I believe, quite confidently, that we shall meet any challenge successfully, and that the resourcefulness of our people will still be able to improve free institutions, in order to provide that degree of individual security which our society finds it necessary to achieve."

—S. BRUCE BLACK, President, Liberty Mutual Insurance Company.

WITHOUT health of body, and, more specifically, normal functioning of the mind, the kind of peace that is so sorely needed in this world today is impossible. Medical science can give health to no one, but it is daily becoming more competent in guiding those who wish to earn health. Health itself has equal value and significance to all, irrespective of age, job, station, race, color, or creed. Discussion of health—your health and mine—serves as a pleasant meeting ground for amicable discourse and mutual understanding. As few live long enough to reminisce in idle happiness upon past accomplishments, whether great or small, an all-out approach to positive or optimum health must become the personal goal of everyone. It will bring to life greater length, greater depth, and breadth as well. The healthy man will have the opportunity to live long enough, deeply enough, and widely enough to think. What a contribution this would be to lasting peace!—A goal to reach, regardless of effort!

—R. C. PAGE, M.D., General Medical Director, Standard Oil Company (New Jersey), at Detroit, May 25, 1953.

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—W. H. SEYMOUR.

THE modern industrial Medical Department while properly providing therapy of highest quality must not confine itself to the mere treatment of the injuries and illnesses incurred at work. Of even greater import are the placement, control, and pro-

tection of the individual as the number one challenge. The nucleus of this program is the examination clinic. In many industries there is need for an occupational hygiene division which may equal or even exceed the clinic in its staff, its equipment, and the scope of its activities. With the initial physical evaluation followed up by periodic re-checks plus the environmental control of the hygienists the program gains mature stature. The management whose philosophies embrace such advanced planning must be commended for their far-sighted application of the efficient utilization of manpower. It goes almost without saying that there be enough people provided for the professional staff; that these people have adequate specialized training and or experience; that they are provided the physical equipment in a suitable work area which constitutes a favorable climate for best results. Whenever and only when these conditions have been met can we say that industrial medicine has come of age."

—H. GLENN GARDINER, M.D., Medical Director, Inland Steel Company, Indiana Harbor Works.

THE GENERAL PRACTITIONER, the man who becomes the family doctor and treats mom, pop, junior, and cousin Sue, is beginning to knock at industry's door. He wants to be invited inside — not to practice medicine but to observe and learn. He wants to learn more about health and safety conditions and to become acquainted with the daily working environment of persons whom he treats as patients in his own private office. . . . A growing awareness of the need for better understanding between the family physician and industry and a recognition of the importance for the general practitioner to know more about the daily life of his patients are the reasons behind this movement on the part of the doctors. The project gained impetus after a survey showed that 94% of Academy members have industrial cases in their private practice. . . . An example of successful cooperation of this kind was exemplified at Ford Instrument Company, Long Island City, New York, when it sponsored a cancer detection program. Following the cancer detection tests provided by the company, findings were sent by the company's Medical Director to the employee's private physicians. . . . A manufacturing concern which, through efforts of its Medical Director, has been carrying on this kind of program is the Owens-Illinois Glass Company, of Toledo, Ohio. The company has for several years encouraged its plant doc-

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tors to invite the local medical associations to have meetings at the plant. Now, with the program being encouraged by the joint committee on education representing important medical groups, Owens-Illinois plans to step up its program to include other branch plants. . . . Among other companies which have been hosts to doctors in recent months is Curtis Publishing Company, of Philadelphia. This meeting, arranged by the company's Medical Director, was sponsored by the Industrial Medical Association of Philadelphia. All members were urged to bring with them one or more general practitioners. Although the meeting night conflicted with a cancer forum for general practitioners, 30 of the approximately 75 doctors attending the meeting were general practitioners. The meeting was opened with a welcome on the part of some Curtis Publishing Company officers. Guests were then shown the Curtis medical facilities for employees and heard an explanation of what the medical program covers. Instead of a plant tour, doctors were shown a colored motion picture which presents the company's operations — manufacturing, distribution, etc. As a result of this meeting and because of the national program being furthered by the industrial medicine groups and the private practitioners' society, plans are now being discussed in Philadelphia to form a local committee of the two groups to work out some kind of program for a reciprocal relationship.

—Doris M. Thompson, Division of Personnel Administration, National Industrial Conference Board, in *Management Record*, September, 1953.

James B. Conant, former president of Harvard University and presently U.S. High Commissioner to Germany, stated: "To train enough professionals to keep all the people well by curing disease would involve expenditure of so large a fraction of the income of any nation so as to make the cure less attractive to the taxpayer than the disease." And Lord Horder, eminent scholar, medical historian, and physician extraordinary to his late Majesty King George VI of England, believes: "Inevitably, the doctor's work in the future will be more and more educational, and less and less curative. More and more will he deal with the physiology and psychology of his patient, less and less with his pathology. He will spend his time keeping the fit fit, rather than trying to make the unfit fit."

—R. C. Page, M.D., General Medical Director, Standard Oil (N.J.).

All too frequently, a patient makes a satisfactory recovery from an acute episode only to delay his convalescence and interfere with the maintenance of his health because he was not adequately advised in regard to his work capacity and what limitations he should place upon himself. The case of one of our supervisors illustrates this point very well. He had been under the care of one of our leading clinics for treatment of an anginal type of pain which was diagnosed as coronary insufficiency. When he

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returned from the clinic, he was questioned about any instructions which had been given him in regard to pursuing his normal duties. The patient had been informed that he could return to work but he should "take it easy for a while." Further inquiry brought out the fact that they had failed to question him regarding his work and it just so happened that, in spite of being a supervisor, his work required constant walking during the entire day. Some of our finest clinics sometimes forget that "patients work." How much work is involved when you "take it easy?" How long is "a while?"

—E. A. Irvin, M.D.

Industrial medicine and surgery are a type of medical practice that has been developing over the past 80 years—with its greatest development in the last 40 years. With the advent of the railroads, there were times when medical care was needed by injured employees, injured passengers, and, on certain occasions,

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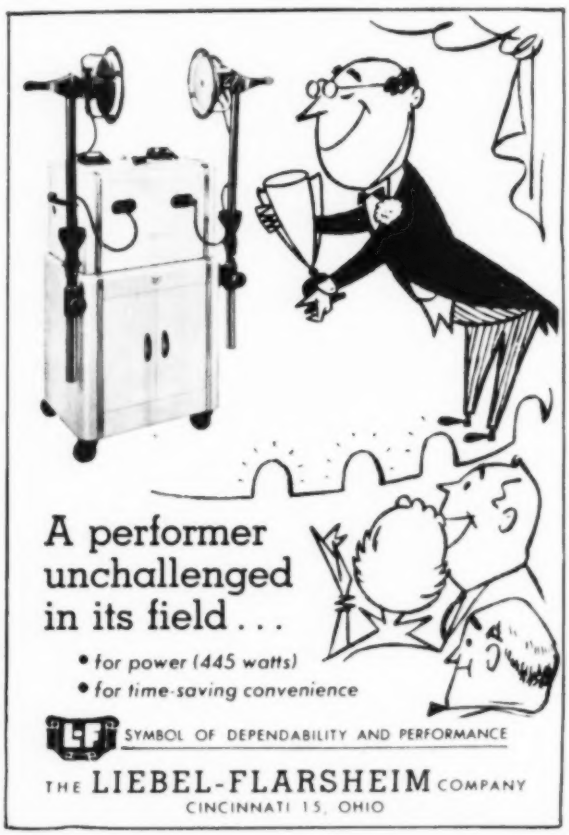

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injured trespassers. This was the start of the era of the railroad surgeon. It became necessary to qualify the physical fitness of engineers, firemen, tower men, dispatchers, and all employees operating trains. These railroad surgeons, then, were among the first to do preplacement physical examinations and periodic physical examinations. With the development of the mining, logging and lumber industries, naturally in distant or isolated locations far from civilization and adequate medical service, came the demand for mining camp and logging camp medical services. These pioneer industrial physicians and surgeons had many rugged experiences. Numerous outstanding physicians and surgeons got their start in this type of practice. Dr. Robert T. Legge, of Berkeley, California, who has completed over 50 years' of active practice and teaching in occupational medicine, started his career as physician and surgeon in a logging camp. A fine example of this type of industrial medical practice is a program sponsored by the Hawaiian Sugar Planters' Association. This program furnishes excellent medical and hospital care to plantation workers. There are more than 27 hospitals and medical services established at the various large plantations. The high quality of this medical service has long been recognized. More recently, similar medical services have been provided on rubber plantations and numerous industrial installations such as oil and mining operations in foreign countries. The rapid industrialization since 1890 has resulted in all kinds of mechanical development, including the automobile and airplane. Numerous accidental injuries during work resulted in safety consciousness and safety programs. Soon after 1910, came the workmen's compensation laws and, more recently, the occupational disease laws that recognize the importance of proper diagnosis and adequate treatment of occupational diseases arising out of and in the course of employment. This period resulted in the adequate treatment of traumatic lesions and especially their early restoration and rehabilitation. Diagnosis and treatment of fractures, burns, hernias, head and abdominal injuries, and surgery of the hand were sub-

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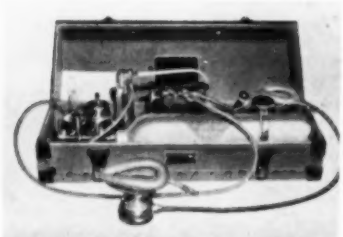

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jects discussed at that time in the various meetings of medical societies and associations interested in industrial medicine and surgery. Restorative plastic surgery and physical therapy and rehabilitation were pioneered in many of these industrial medical clinics. Then came the advent of comprehensive medical services in industry. These included the use of adequate diagnostic and treatment facilities. Adequate x-ray and diagnostic laboratory facilities became regular equipment in these departments. The industrial nurse, physical therapist, industrial hygienist, all proved how important their contributions were to over-all, comprehensive industrial medical service. Specialist consultants were called in to study and treat problem cases. Preventive medical procedures became more important in the industrial health picture and included chest x-ray surveys, early diabetes detection studies, and proper mental and physical placement of workers. Some of the larger industries have as many as 40 persons included in the Medical Department to service 25,000 employees. The administration of such a group of medical personnel and allied technicians has become one type of occupational medical activity. There are constantly increasing efforts to supply similar medical services to smaller industries, with the ultimate goal of the best possible health for all employed workers. Great and many are the challenges to the physician in this specialty field. He achieves happiness and satisfaction by meeting these challenges adequately and, in the meantime, earns a worthwhile income and has a position of real prestige among the workers, the management and the community.

—E. C. HOLMBLAD, M.D., in *J. Student A.M.A.*, February, 1953.

TO MEET the operational responsibilities of a Medical Department in industry, the physician must accept wholeheartedly and constantly keep in mind the primary purpose of industry. It may seem trite to labor the point. Yet, problems which plague a physician in industry arise frequently enough from the oversight of industry's primary purpose as to warrant emphasis. Industry functions with operating departments as the central structure, with auxiliary or service departments attached as they are required or prove themselves to be useful. Such auxiliary departments are exemplified by the legal department, the personnel department, research and exploration departments, advertising, safety, traffic, engineering groups, etc. The Medical Department in industry is such an auxiliary department. The Medical Department does not keep a profit and loss balance sheet; it does not manufacture or sell goods. It can justify its existence only through service to departments which do manufacture and sell. Its service must, in the final analysis, help operating departments in their job of manufacturing and selling at a profit. There are two approaches to the exercise of the operational responsibilities of a physician who serves industry. One is through plant environment, the other is through the employee. In the environmental approach the physician needs to familiarize himself with raw materials used, manufacturing processes of his plant, its lighting, ventilation, sanitation and cleanliness, temperature and humidity, and other items which characterize its environment. In the approach through the employee the physician should help select the right man for the job and strive to keep that man fit for the job. The physician should know the principal physical and mental requirements of the job. He should have the judgment and initiative to utilize opportunities for putting this knowledge into effect. To reiterate, both the material side (industrial hygiene) and the human side (clinical medicine) must be considered in the physician's discharge of his operational responsibilities.

—LEMUEL C. MCGEE, M.D., in *J. Med. Assoc. Georgia*, August, 1953.

THE REAL industrial physician is directly identified with industry, and usually functions on its premises. Such a physician is imbued with the philosophy of constructive medicine and is con-

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versant with the philosophies of industry, production, and manpower. He is versed in the peculiar administrative requirements of this task, directs or understands industrial hygiene, maintains a preventive program, and is competent in the allied matters of safety engineering, employment, compensation and other forms of insurance. That which marks the industrial physician as such is that in addition to outstanding qualifications as a physician he moves with facility among machines, materials, manpower, products and processes, and program group enterprises. What better groundwork or training could a man have to fit him to meet these requirements than the training of a general practitioner? He first of all must be a skilled physician, skilled not in one or two fields, but skilled in the general field of medicine. His patients in industry are workers and they are people—the same kind of people he cares for in general practice. These people

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have problems—problems not entirely related to their occupation. A medical program in industry that does no more than treat occupational injury and disease is not worthy of the name. The successful industrial physician must treat the patient as a whole, not only that part of him that is engaged in industry. He must understand him, be sympathetic to his problems and worries. He must realize that a worker who is worried about a sick wife or child, or about an overdue mortgage cannot be an efficient worker. He must be prepared to counsel him, not as a worker, but as an individual with individual problems of great complexity. He must treat soul as well as body. Who, but a general practitioner could successfullly do this? The industrial physician has only one objective in his relation to workers, the maintenance of a work force sound in body and mind,

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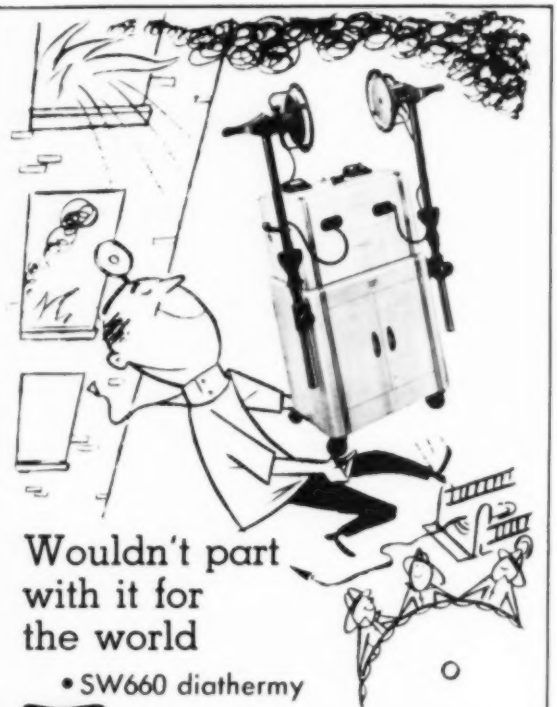

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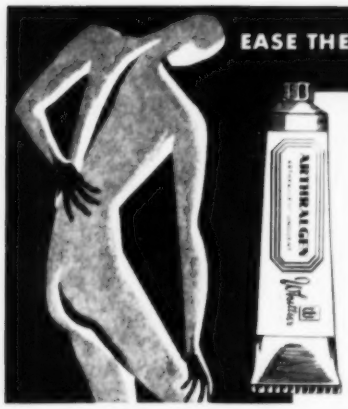

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us for a moment consider the day's work of an industrial physician, thinking as we enumerate his tasks, how well the general practitioner is qualified to perform them. We may begin with the pre-employment examination. This is not a process whereby only the supermen are sorted out for employment, but rather a preplacement examination. The physician tries to see the prospective employee as a whole; he notes his strength and his weakness; he sees his good points and his defects. He tries to fit this man or woman into the industrial picture from a physical and mental standpoint, just as the personnel officer does from the standpoint of qualifications for the job. He does not reject the man because his back is not strong enough to do the heavy lifting required of a truck driver, but recommends that he be given other employment for which he is physically and mentally suited.

—JOHN F. KILGUS, M.D., in *Industrial Medicine and Surgery*, May, 1953.

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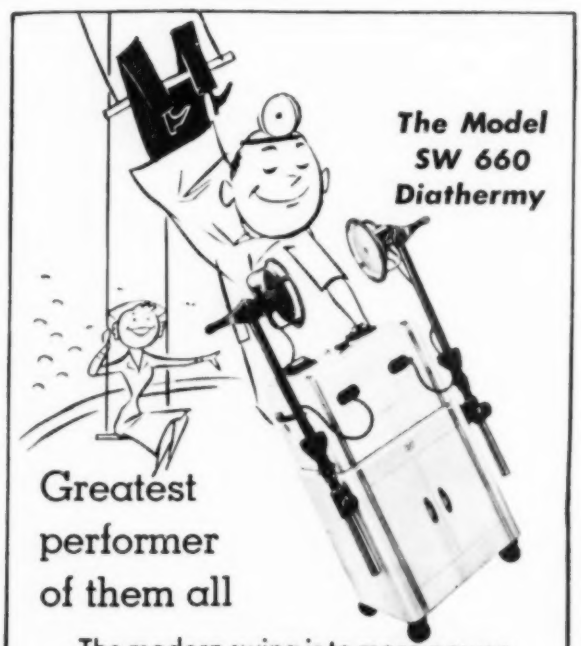

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1. Crunden, A. B., Jr., and Davis, W. A.: Am. J. Obst. & Gynec. 65:311, 1953.

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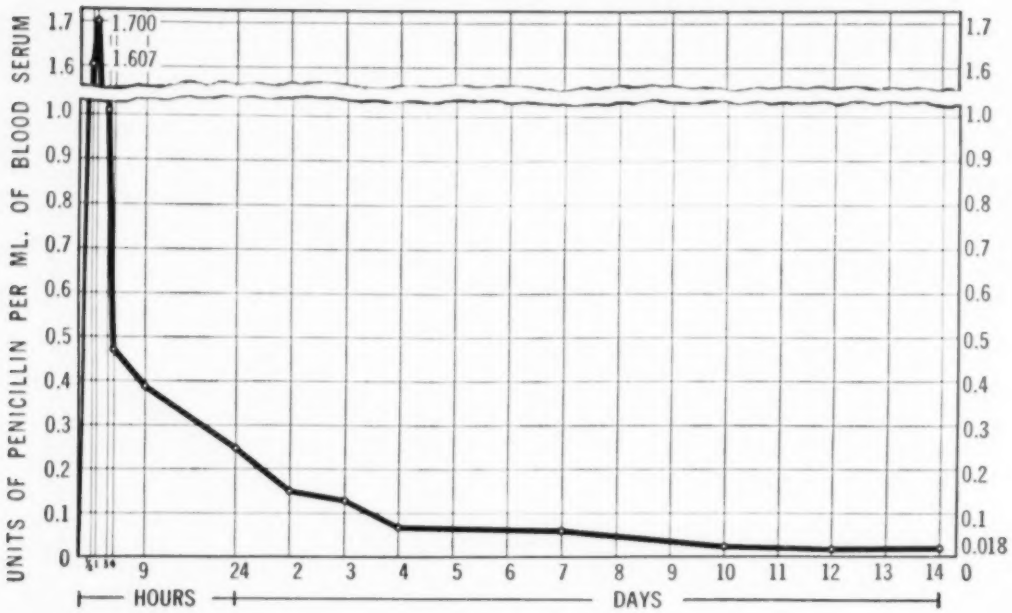

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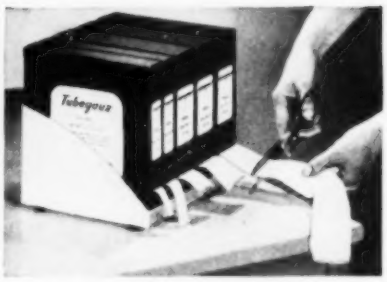

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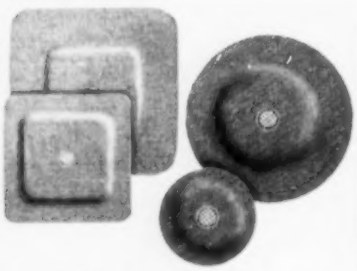

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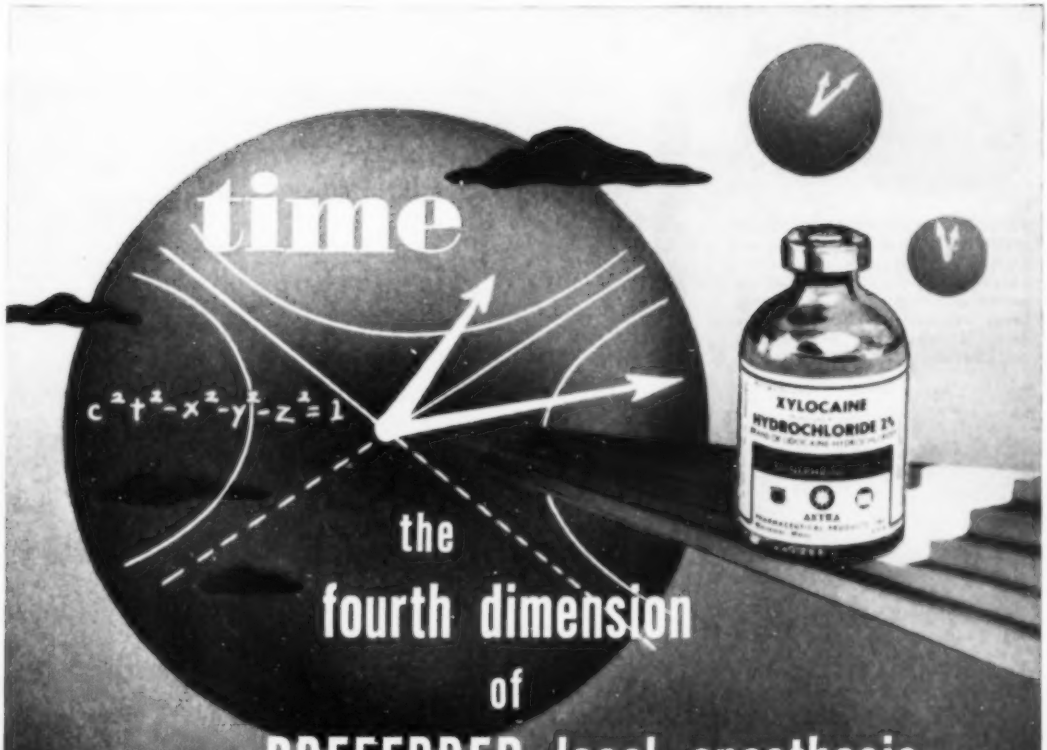

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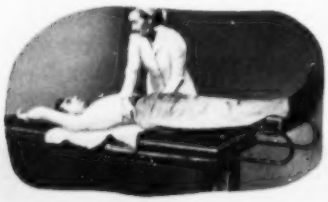

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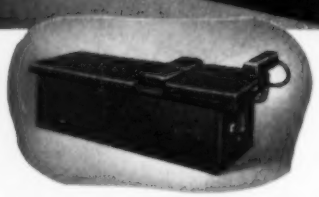

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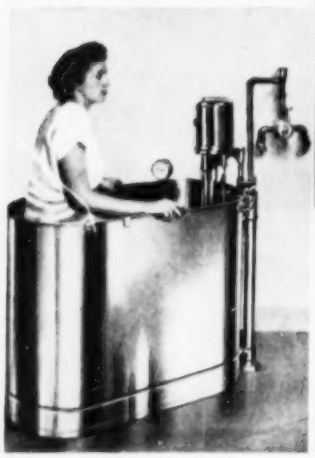

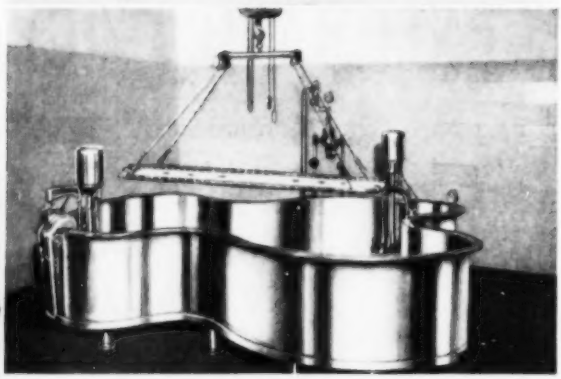

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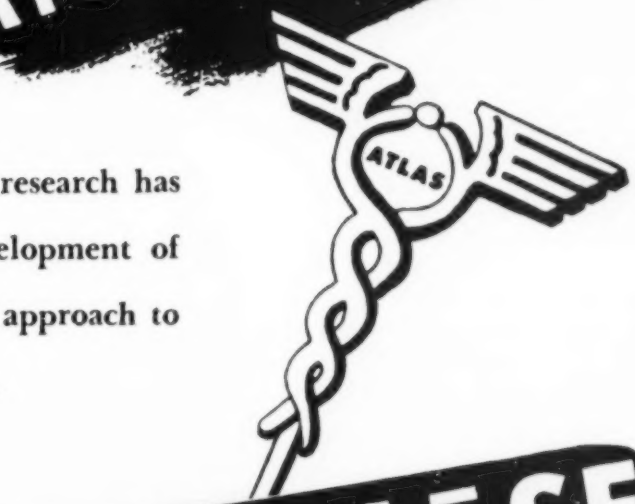

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1. Behrman, H. T., Combes, F. C., Bobroff, A., Leviticus, R.: Ind. Med. & Surg. 18:512, 1949.
2. Turell, R.: New York St. J. M. 50:2282, 1950.
3. Heimer, C. B., Grayzel, H. G., and Kramer, B.: Archives Pediat. 68:382, 1951.

"...a marked advance in wet dressing therapy..."[1]

1. Peck, S. M.; Traub, E. E. and Spoor, H. J.: Aqueous Solutions of Sodium Propionate with Chlorophyll as a Therapeutic Agent: A.M.A. Arch. Dermat. & Syph. 67:263, 1953.

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REFERENCES:
1. Gastric Tolerance for Aspirin and Buffered Aspirin. Ind. Med. 20:480, Oct. 1951.
2. Effect of Buffering Agents on Absorption of Acetylsalicylic Acid. J. Am. Pharm. Assoc., Sc. Ed. 39:21, Jan. 1950.

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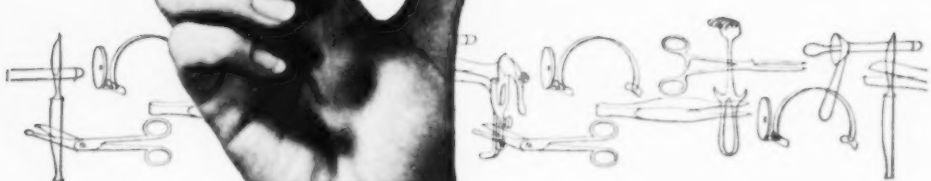

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